FOOD ENGINEERING

OCTOBER, 1956

A McGRAW-HILL PUBLICATION

PRICE 35 CENTS

QUALITY CONTROL • Rahr researcher 'draws a bead' on a malt-product improvement. See p. 49

ENGINEERING • For quick figuring of heat-process data, tear out this chart—p. 43

ALSO: PERSONNEL · PRODUCTS · TRANSPORTATION
PROCESSING · PACKAGING · SANITATION · INSTRUMENTS
MAINTENANCE · INGREDIENTS · MATERIALS HANDLING

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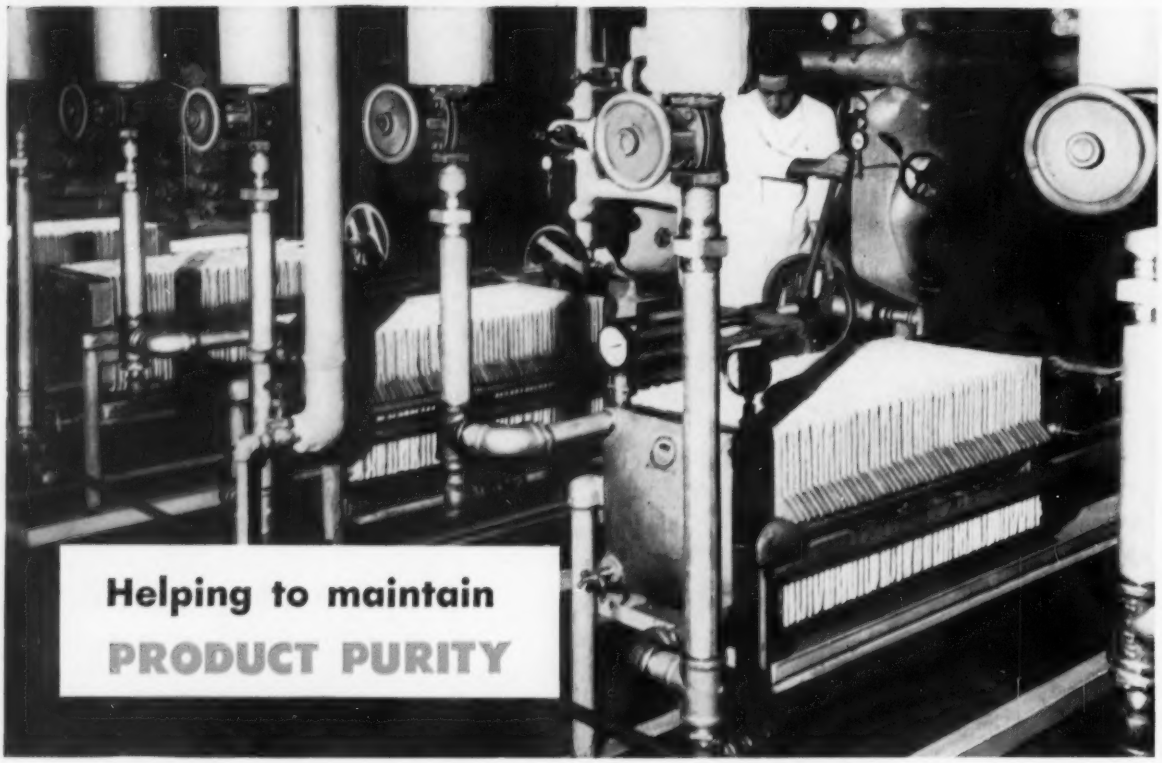


Pre-filtered water at Hoffman Beverage Company being pumped through bank of filters. Grinnell-Saunders Diaphragm Valves shown are stainless steel.

GRINNELL-SAUNDERS DIAPHRAGM VALVES

For help in preserving product purity, Hoffman Beverage Company (above) turned to Grinnell-Saunders Diaphragm Valves. Working parts of the valve are completely isolated at all times from the fluid in the stream. There's no disc holder in the stream; no chance of valve lubricant contaminating the product. Furthermore, the diaphragm lifts high for unobstructed flow in either direction with no pockets to trap fluid. Resilient diaphragm and large area of contact on the valve weir assures leak-proof closure.

Of course, simple maintenance is important, too. The only part of the valve that normally needs replacing is the long-wearing diaphragm, which can be inserted quickly, without removing the valve from the line.

Grinnell offers its diaphragm valve in a wide range of body and bonnet styles and also body, lining, and diaphragm materials. For the beer industry, for example, Grinnell has an *all-bronze* valve with fully-rounded opening, which permits ball-brush cleaning through the valve.

If you have a valve problem, it will certainly be worth your while to consult a Grinnell engineer.

Choice of materials

Bodies
Iron; cast steel; stainless steel; Durimet 20; Hastelloy A, B, C; bronze; Monel; aluminum; PVC (polyvinyl chloride); Saran

Body Linings
Hard rubber; soft rubber; neoprene; glass; lead; plastics; Heresite; Lithcote

Diaphragms
Soft natural rubber; natural rubber; white synthetic rubber; neoprene; reinforced neoprene; butyl; Hycar; Teflon; Kel-F; PVC (polyvinyl chloride); polyethylene

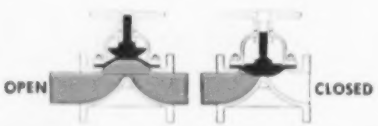
Bonnets
Iron; stainless steel; bronze; other materials on special order

Valve types

Straight Bodies
Screwed; flanged; socket weld; butt weld; socket (solder); sanitary threads; hose ends; Victaulic

Angle Bodies
Screwed; flanged; socket weld

Bonnets
Handwheel (non-indicating stem, indicating stem); chain wheel; lever (for quick operation); sliding stem (for a wide selection of power operated topworks).



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industrial supplies • Grinnell automatic sprinkler fire protection systems • Amco air conditioning systems

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OCTOBER 1956

Volume 28 Number 10

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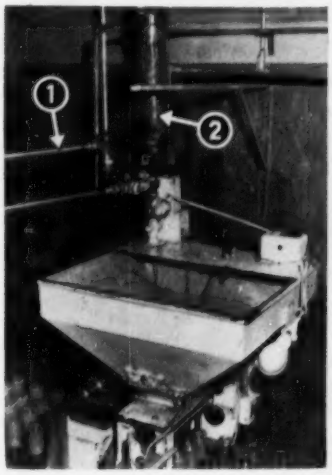
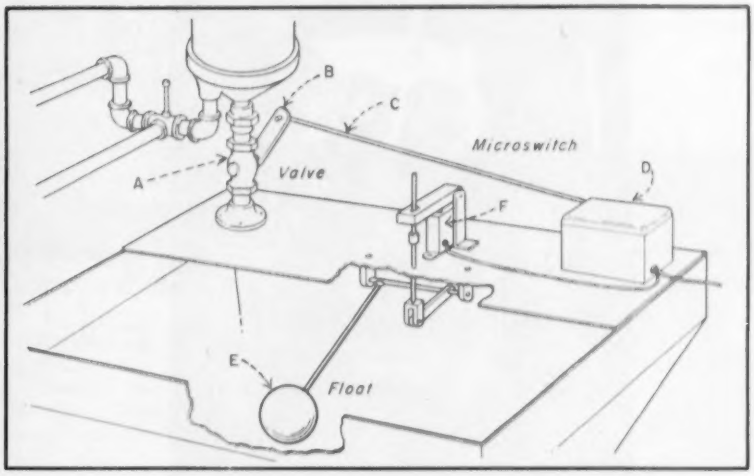
TEAR OUT AND FILE

PRACTICAL IDEAS





Novel Filler Bowl Feed Control

Our peanut butter filling line is located at a distance from the production area, and also from the product storage tank. It was necessary, therefore, to solve two mechanical problems to insure efficient filling operations with minimum interruption.

One difficulty faced was prevention of product congealing in the long pipe between the storage tank and the filler bowl, thus avoiding the danger of a pump or pipe bursting, with resulting line shutdown. The other problem, which hung somewhat on the solution of the first, was to regulate the flow of peanut butter into the bowl that supplies the filler, since the filling rate will vary.

A return pipe was installed—(1) in photo—from the filler back to the storage tank for the purpose of circulating the butter when it was not feeding into the filler bowl. The heat exchanger (2), in which hot water is the medium, re-warms butter between circulating pipe and the filler bowl.

Flow of product from heater into filler bowl is regulated by a plug-type valve—(A) in sketch. Lever arm (B), which opens and closes the valve, is operated through control rod (C). This rod is actuated by a household type furnace damper regulator (D).

When the level of peanut butter in the filling hopper falls to a predetermined depth, resultant lowering of the plastic float (E) closes the Microswitch (F), which in turn closes the circuit to start the motor in the "furnace-damper control."

When feed valve (A) is closed, pressure that builds up in the feed pipe opens a relief valve to permit circulation of the product back through the return pipe to the supply hopper.

Product is now maintained at a safe temperature, while the supply in the filler bowl is satisfactorily controlled.—*C. D. Fulton, Plant Engineer, Old Dutch Foods, Inc., Blasdell, N. Y.*

Ends Lumping in Bulk Sugar Car

When our first bulk sugar cars were received, we noticed that some moisture was present inside them—causing lumps to form in the sugar.

Investigation revealed that this moisture was not from external sources. It was caused by warm air from the sugar contacting the cold metal of the access opening in the top of the car.

To remedy this, Masonite covers were put in these openings. This has prevented the warm air from reaching the cold metal, and so eliminated condensation and reduced lumping.—*Technical Bulletin, General Foods Corp.*

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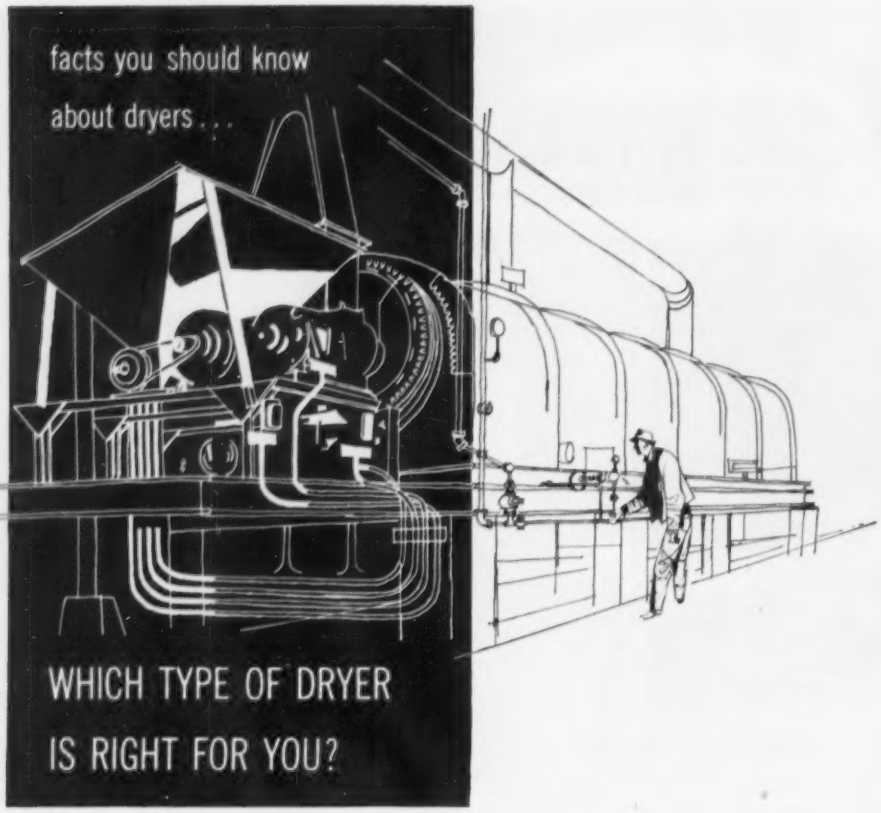

For over 55 years, Louisville Dryers have been solving industry's drying problems and effecting marked economies. The following is intended as an introduction to selecting the right type of dryer.

Q. *What types of dryers are there?*

A. Many types. They can be classified in two basic categories, namely, batch type and continuous.

Q. *What is proper application of the continuous type?*

A. Where large enough capacity is required to make savings in labor, space, and fuel advantageous.

Q. *What are some other advantages of the continuous type?*

A. Uniform quality of dried product. Lower drying cost.

Q. *What types of continuous dryers are most used?*

A. Rotary, Conveyor, Flash, Spray, Atmospheric Drum.*

Q. *Do all of the above types handle the same kind of material?*

A. No. While they discharge a dried solid, Spray and Drum Dryers are fed with a liquid. (Liquids and thin slurries can be handled in the other types by means of special designs or auxiliary equipment, but seldom are).

Q. *How can I be sure of getting the right type of dryer for my operation?*

A. Louisville engineers start by surveying your needs. Then, after considering the pertinent factors, they make recommendations for dryer type, heating medium, etc. Their recommendations can be proved by practical drying tests in General American's pilot plant. Your Louisville Dryer is then designed and built to suit your particular purpose and to fit your individual needs.

Q. *How can I investigate the matter in greater detail?*

A. Call in a Louisville engineer. No cost or obligation.

*Discussions to follow will deal with the subject in more detail.

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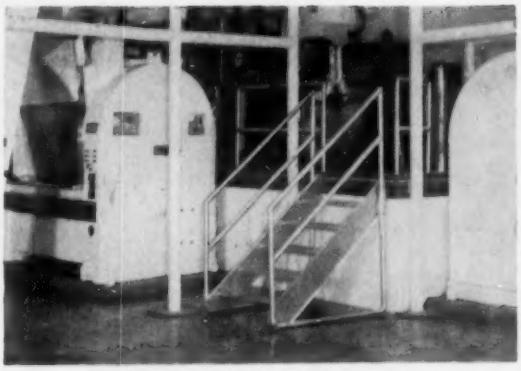
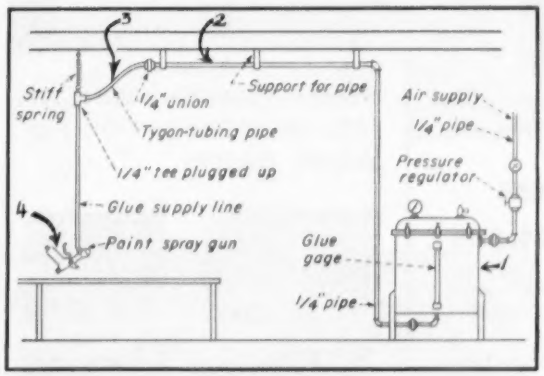


Sanitary Portable Stairs

To facilitate cleaning, we have designed and had constructed stairways and stiles that are movable.

Being quite heavy, since they are fabricated of pipe and steel, those parts that contact the highly polished, easily damaged maple floor are designed with smooth bottoms and upturned ends to facilitate sliding.

Stairs are easily moved from normal positions for thorough cleaning, then returned when cleaning is finished.—*Langendorf United Bakeries, Inc., Bell Gardens, Calif.*



Brush Glueing Discarded

For over 20 years, case-sealing operators at our plant applied glue by brush. Now we have discarded the brush method, hence the case-closing area is no longer messy and the operator can glue and seal twice as many cases.

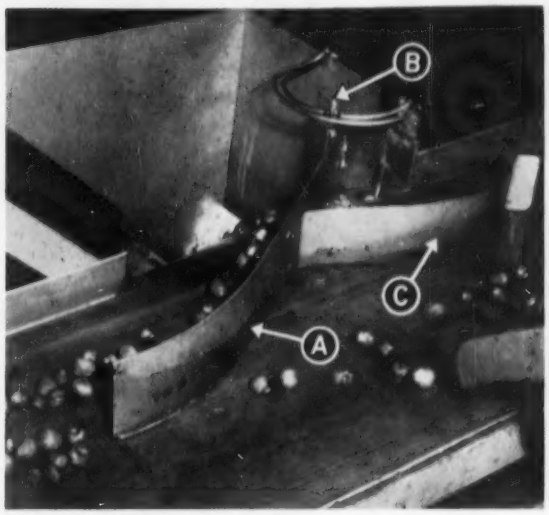
Our new system is easy to install and will not strain the purse strings. We provided a tank that holds 10 gal. and is suitable and safe for pressures up to 30 psi. We fill the container with glue once a week.

From the tank—(1) in sketch—overhead pipe (2) brings glue to the case-closing area. The drop from the overhead pipe is through Tygon tubing (3).

Application of glue to case flap is accomplished by a spray gun (4) which delivers a small stream. No compressed air is needed at the nozzle, and so none is delivered to the air intake of the gun.

Discharge of glue is due only to the pressure in the tank. Therefore, the control needle in the "paint" side of the gun serves as a valve to efficiently close the outlet.

This system can be employed to operate several gluing stations from a single tank and overhead distributing system.—*Jack V. Walton, T. W. Gardner Food Co., Winston-Salem, N. C.*



Strawberry Flow Control

To get proper flow volume of our strawberries—moving from the distribution conveyor to the elevator-conveyors leading to the four slicer-mixers on our mezzanine—required shear-gates that could be easily and rapidly adjusted.

After a number of trials, we developed a gate—(A) in photo—which may be set in any position in a 90 deg. arc by the adjustment of a wing-nut (B).

The gate is made of 10-gage Type-302 SS and has an additional arm (C) bolted to it. This strip will not permit berries to accumulate in the area behind the shear-gate.—*Engineering Dept., Stokely-Van Camp, Inc., Santa Clara, Calif.*

Curbing Lube on Packagers

Since automatic packaging machinery is usually both complex and compact, it can be a big chore to clean—and by the same token quite difficult to insure against excessive lubrication.

However, the use of nylon cam follower rolls, instead of the usual steel rolls, eliminates the need of lubricating the cam raceway, roll, and roll stud. This will lighten the cleaning task and eliminate excessive oiling.

Tip: When fitting nylon cam rolls to a steel stud, extra clearance must be provided by boring the rolls 0.002 or 0.003 larger than the steel rolls.—*T. Cherbas, Mechanical Engineer, Battle Creek, Mich.*

How "SURE-WAY" Package Casers Cut Costs, Simplify Cartoning Operations

"Utilization of your 'Sure-Way' Package Caser has reduced our direct labor from five people to one," says E. L. Marschner, Director of Operations, The Dromedary Company, Division of National Biscuit Company.

This kind of cost reduction is not uncommon wherever automatic, high-speed (up to 300 packages per minute depending on package size and casing pattern) "Sure-Way" Casers have been installed. One operator is all that's needed, with the inherent advantages of reducing labor turnover, and eliminating personnel training and substitution problems that frequently characterize manual casing operations.

Check the moderate initial investment. Look at the compactness (80% less space in some instances), the near-human performance, versatility, and gentleness to packages, overwraps and labels. This is the caser that "protects the package that protects the product," with speed, precision and profits.

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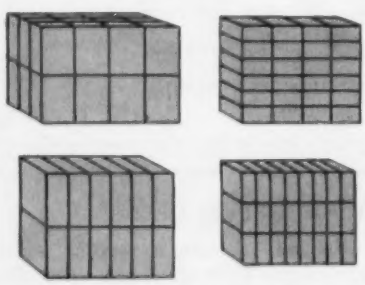

What case loading pattern do your packaged products take? Do you use top-opening or end-opening cases? Do you have more than one package size or case pattern to handle on one machine? Sketched above are only four of dozens of possibilities. Our packaging engineers will welcome the opportunity of reviewing your problems and making recommendations. It will be helpful if complete information is supplied with inquiry. No obligation, of course.

Write for fully descriptive Bulletin No. CMD 601-W

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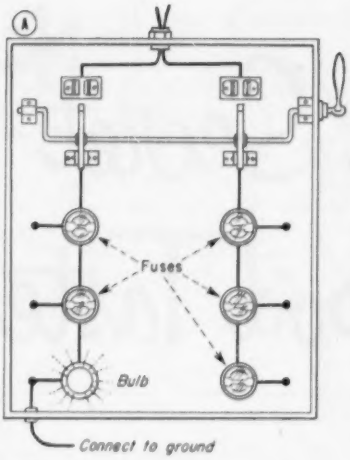
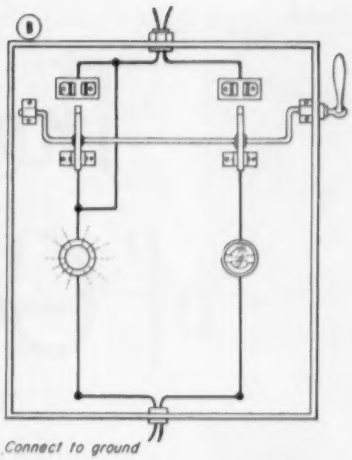
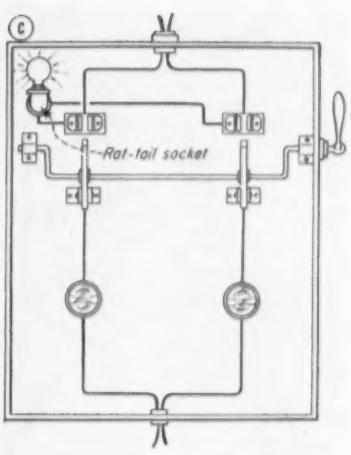


Multiple-fuse box with a vacant fuse plug.



Double pole, single-throw switch used for off-on switch on light circuit.



Fuse box with no empty fuse plugs.

Moisture-Proof Switch Box

In our high humidity cheese curing rooms, electrical switches frequently shorted or corroded, thus causing many safety and maintenance problems.

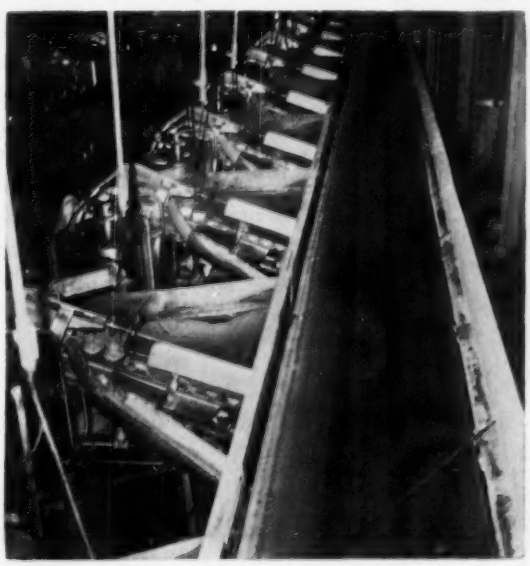
Here's how we now prevent corrosion and shorting-out in our fuse and switch boxes:

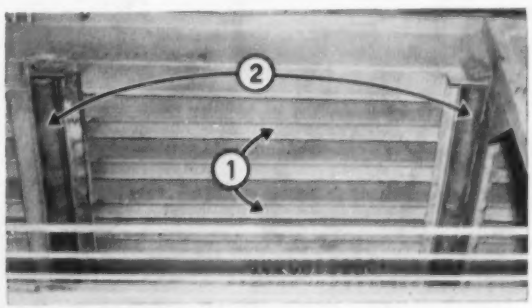
We installed in each box a 7½ w. bulb, such as is often use as an ornamental or night light. Then the circuit was wired in such fashion that the bulb would burn continuously.

In those boxes which use screw-type fuses, the bulb was merely screwed into a vacant fuse receptacle and a jump wire placed across the switch to feed the bulb.—(A) and (B) in sketch.

In other cases a "rat tail" light socket (C) was attached inside the box ahead of the switch. Incidentally, we have found that doors of most boxes still close easily after the "rat tail" light socket has been installed.

The 7½ w. bulb produces just enough heat to keep the box safely dry and free from corrosion, as well as lighting the box at all times for more convenient fuse inspection. Since the bulb is wired ahead of the switch, it will continue to burn even when a fuse is blown.—*E. M. Graham, Associate in Dairying, Clemson Agricultural College, Clemson, S. C.*





Bearings for Wet Areas

During our operating season, the 30-in. belts (left photo) supplying fruit to extractors in the plant take a considerable beating.

They are always wet, due to water drip as well as wash down. This was why we installed slide-bed type conveyors employing steel strips as supports—(1) in photo above.

Though the drive power required was high for this

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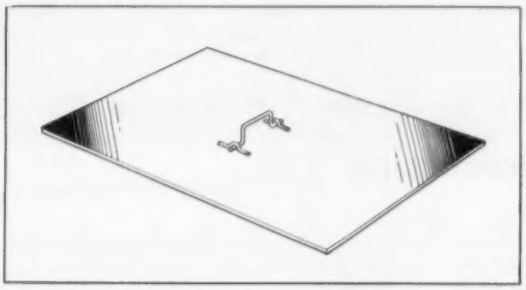
type conveyor, excessive maintenance of rusted bearings was avoided.

Then, on 40 to 44-in. centers, rollers—(2) in photo—were installed across the belt width to reduce the friction of the conveyor, and thus lower the drive power requirements.

The use of rollers where the belt is normally wet was made possible by resorting to special oil-impregnated Arguto wood bearings, which are not affected by water, and which require little or no maintenance.

Thus, our power requirements for the conveyors have been considerably reduced.—*H. E. Osteen, Plant Engineer, Snively Groves, Inc., Winter Haven, Fla.*



Dockboard Handling Simplified

At our receiving dock we have been using heavy steel sheets as dockboards. Since we usually drive a fork truck into the trailer to remove the load, a heavy gage steel is necessary.

If the sheet is light enough for easy manual handling, it tends to warp. On the other hand, if it is heavy enough to take the load it is too difficult to put in place—even by two men.

To solve this problem we made a folding handle of steel rod, and welded it in the center of a heavy steel plate. The handle is wide enough to accept one of the forks of a lift truck.

The plate can thus be picked up and positioned very easily. When in place, the handle folds down. And since it is in the center of the plate, the wheels of the fork truck straddle it on entering and leaving the trailer. —*Charles M. D. Reed, President, The Taylor-Reed Corp., Glenbrook, Conn.*

Removes All of Frozen Fruit

At Gerber Products Co., Oakland, Calif., we have constructed a "surface defroster", which melts only the surface of the core of frozen fruit purees stored in 30-lb. tins. This permits the operator to slide most of the frozen material from the cans.

When some products still cling, these are removed by penetrating the bottom of the can with a sharpened air nozzle and blowing the frozen blocks out. But residual slush-like product still tended to cling inside.

To remove this remaining puree, we built a four-bladed rubber squeegee (see photo) and installed it in a vertical position above the puree receiving vessel. Now, after the frozen core is removed, can is inverted over this squeegee and rotated. The rubber blade skims the residual product from the surface.—*Engineering Dept., Gerber Products Co., Oakland, Calif.*

CAN YOU USE $50?

Then here's an opportunity to get it.

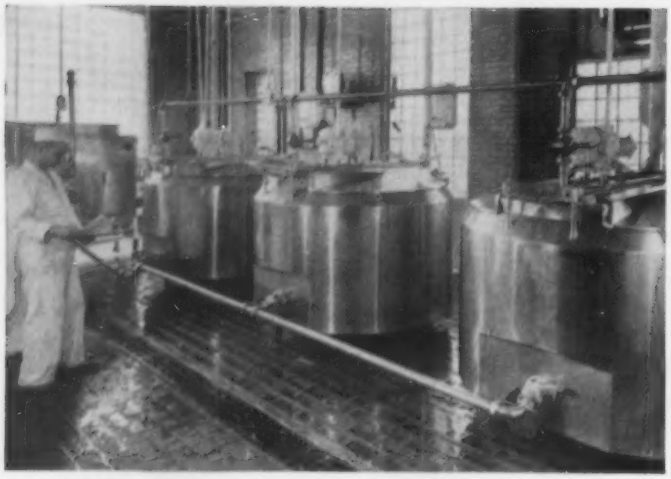
Send one of your ideas to FOOD ENGINEERING. Each month $50 is presented to someone like you for the best item in this department. And the chance that it will be you is now running about one in twelve.

Also $5 to $15 is paid for each contributed item used. So a few minutes time may net you as high as $65.

Just send us the facts about your idea and its application. And include a free-hand sketch or snapshot to illustrate it.

We'll do the finished writing and drawing for you. Send it today, before you forget. Address it to Practical Ideas Editor, FOOD ENGINEERING, 330 W. 42nd St., New York 36, N. Y.—The Editors.

AUGUST PRACTICAL IDEA WINNER was "De-Oiling Refrigeration System," sent in by G. M. Norton, Refrigeration Superintendent, Producers Produce Co., Springfield, Mo.



Cherry-Burrell Model "WP" (300 gal.) Spray Type Round Processor—for steam or hot water heating to 200° F; cooling to within 10° of city, well or tower water.

Cherry-Burrell Model "EP" (1000 gal.) Enclosed Waterway Round Processor—for low-temperature cooling with high-velocity refrigerated water; heating to boiling temperature using hot water or steam.

Look first at all four types of Cherry-Burrell Processors before you buy any Processing Vat

You'll find it's sound purchasing procedure to look over *all four* types of Cherry-Burrell Round Processors *before* you decide which particular model best suits your requirements.

That's because Cherry-Burrell Processors give you such a wide choice . . . *the widest you can get anywhere* . . . of ways to process products. As illustrated here, there are four different models to choose from; each uses a different method to heat and cool a wide variety of liquid and semi-liquid products. Each comes in standard sizes from 200 to 1000 gallons, with special sizes available.

In addition, Cherry-Burrell Round Processors give you a choice of the *exact degree* of agitation your product calls for . . . ranging all the way from mild agitation for delicate products up to vigorous action for heavy-bodied mixtures.

Ask your Cherry-Burrell Representative which model best solves your specific processing and plant problems. Or send for our new bulletin.

CHERRY-BURRELL
CORPORATION

427 W. Randolph Street, Chicago 6, Ill.

Dairy - Food - Farm - Beverage - Brewing - Chemical Equipment and Supplies

SALES AND SERVICE IN 58 CITIES - U.S. AND CANADA

Cherry-Burrell Model "V-P" (300 gal.) Vacuum Pressure Processor—for steam or high-velocity hot water heating under vacuum. Pressure cooking to 250° F; for cooling to 40° F. with refrigerated water. Air unloading of product available.

Cherry-Burrell Model "DP" (300 gal. and 500 gal.) Direct Expansion Cold Wall Round Processor—for steam heating to 200° F; for low-temperature cooling with self-contained refrigerated water and direct expansion in combination.

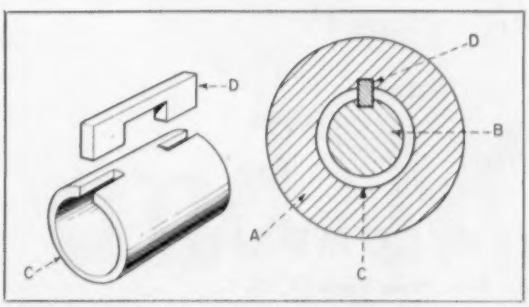
Automatic Warning Signal

We take no chances of accidents with our fork-trucks. Drivers are instructed to slow-down and sound their horns when entering or leaving hidden areas, such as door-ways, sharp turns, etc.

Further, we make doubly sure that pedestrian personnel, and other fork-truck drivers, too, are aware of the approach of these machines. This added warning has been "engineered" with a special device—a brake drum, bolted to the front wheel of the fork-truck (photo).

Inside the drum are two bolts which, when the truck is in motion, strike against the drum with a musical bell-like ring.

All employees are now accustomed to the "drum" alarm, as well as the horn. Accordingly, they give the trucks safe right-of-way.—*Security Warehouse & Cold Storage Co., Santa Clara, Calif.*



For Large Bores on Small Shafts

In maintenance and machine repair work it's often desirable to mount a pulley or gear onto a shaft that is smaller in diameter than the bore in the piece to be fitted.

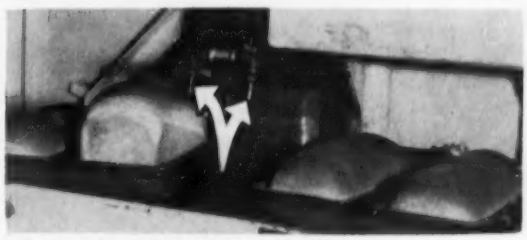
This situation may be further complicated by the need for a positive drive by means of a key between the two members.

A collar with a longitudinal slit to fit on either side of a solid key might seem a suitable solution. In practice, however, this rarely proves satisfactory since bushing and key too often separate.

Instead, there is the following efficient solution:

The diameter of fitting bore—(A) in sketch—is larger than shaft (B) to which it is to be rigidly attached. A bushing (C) is fabricated to fill clearance between shaft and fitting. Now fit to bushing a deep key (D), which is notched at its approximate center. Bushing has a slot cut in each end so that key can engage snugly.

This form of combined deep key and bushing has been used very successfully where a milling cutter having a 1¼-in. dia. bore must be used on a milling machine with a 1-in. dia. arbor.—*Clifford T. Bower, Tool Engineer, London.*



Ups Bread Depanner Efficiency

Even with coated pans, raw material and temperature variations occurring in mixing, proofing, handling, and baking of bread at our plant sometimes caused loaves to stick stubbornly.

When this happens in plants using automatic bread depanners, it can cause costly slowdowns. For when the loaves stick, they must be depanned manually.

To help eliminate this, we've installed two compressed air jets at the end of the oven. These are positioned directly above to play just inside the ends of the passing pans (see photo).

As the pans pass under these jets, the compressed air —lowered from 100 psi. by reduction valve—penetrates between the loaves and the pans, separating the loaves from the containers and assuring more efficient operation of the automatic depanner.—*Carl Labozetta, Chief Engineer, Langendorf United Bakeries, Inc., Bell Gardens, Calif.*

Hammermill Control

Full-capacity ratings can be maintained on hammermills, and other equipment where the load depends on the rate of feed, by use of commercially available devices.

These sense the motor load and make suitable automatic adjustments in the feed rate.—*Technical Bulletin, General Foods Corp.*

NIAGARA

NEW HYGROL brings you an original Niagara Drying Method with complete control of the amount and rate of moisture removal and control of product quality.

NO FROST is Niagara's original method and the only method giving you always frost and ice free refrigeration for pre-cooling, chilling, freezing and holding in frozen or fresh storage.

Niagara Service

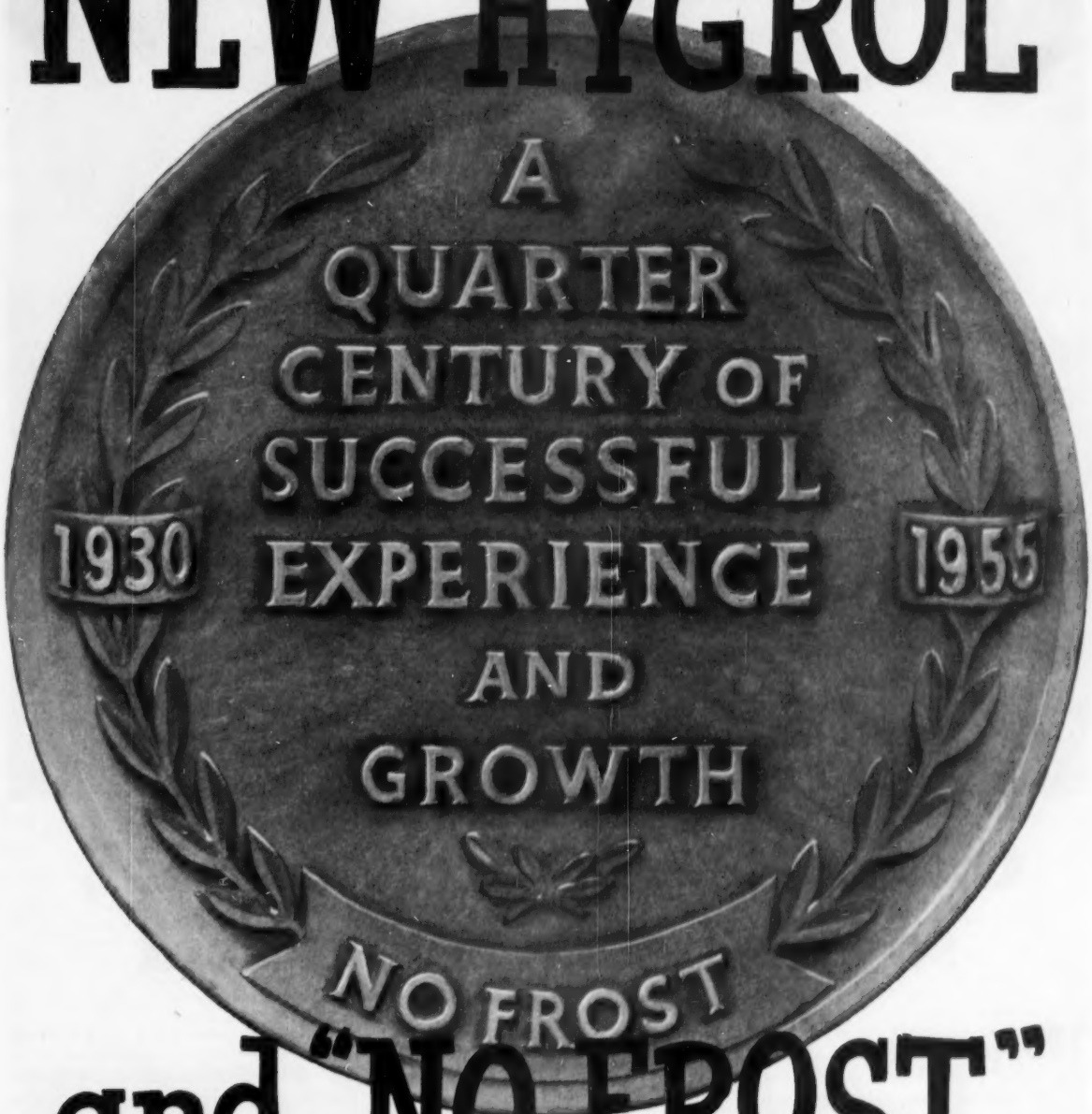
For over half of the fifty years of the AMERICAN MEAT INSTITUTE, Niagara has been making original contributions to the improvement of meat product processing and preservation.

NIAGARA BLOWER COMPANY

Executive Offices: 405 Lexington Ave., New York 17, N. Y.

District Engineers in Principal Cities of U. S. and Canada

NEW "HYGROL"



and "NO FROST"

Niagara "Hygrol" and "No Frost" equipment includes Niagara Air Conditioning Units, Fan Coolers, No-Frost-Liquid Spray Coolers, No-Frost-Liquid and Hygrol Concentrators. Niagara developments are protected by U. S. and foreign patents and exclusive license of the Research Corporation.

For more data, circle this page number on card at back →

B.F.Goodrich

Oil can't soak into Koroseal, so belt never gets rancid

THEY were replacing conveyor belts every 4 to 6 months in this pecan processing plant. Oil from the nuts soaked into the belts, made them rancid. It made some belts get soft and sticky, it made others harden and crack. All kinds of belts were tried—premium rubber, cotton, even plastic coated—but the oil ruined them all.

When a B. F. Goodrich distributor heard their troubles, he recommended the Koroseal belt. Because it's made of Koroseal flexible material, this improved food-handling belt stands nutmeat oils, cooking oils, animal fats, most acids—and just about everything else that ruins most belts.

Unlike belts that are just coated with plastic, Koroseal is used throughout the B. F. Goodrich belt, and so resists cracking and peeling, never gets soft or sticky. Oil can't soak into Koroseal's tough, polished surface; food particles can't grind in. That's why this belt is so easy to clean. No need to scour it. Just a wipe with a damp cloth and detergent, and the Koroseal belt is as clean and new looking as ever. Koroseal belts have no odor, no taste, never get rancid.

After trying a test belt (it is now in its 20th month), owners of the pecan company have had Koroseal belts put on all their conveyors. All of the Koroseal belts have now lasted 50% longer than previous belts, and they all look good for many more years. Let a B. F. Goodrich distributor tell you more about the complete line of belts B. F. Goodrich has developed for the food industry. Or write *B. F. Goodrich Industrial Products Co., Dept. M-745, Akron 18, Ohio.*

Koroseal—T.M. Reg. U.S. Pat. Off.

B.F.Goodrich

INDUSTRIAL PRODUCTS

Now "cook-in" packaging with coatings of ALATHON® polyethylene resin

Housewives find the convenience of this new pouch bag containing frozen shrimp irresistible. It is moistureproof, airproof, odorproof and lightproof. Pop it into water – package and all. Cook without a trace of shrimp odor. Cool and serve.

The new package consists of three layers – printed aluminum foil, a special 15-pound paper, and a 1 mil interior coating of Du Pont ALATHON. ALATHON polyethylene resin provides a perfect heat seal, which prevents dehydration and freezer burn as well as a seal that will not break down when the package is immersed in boiling water. The coating of ALATHON is applied by the Reynolds Metals Company, Louisville, Kentucky, for the Sea Pak Corporation, St. Simons Island, Georgia.

ALATHON is non-toxic and imparts no odor or taste to food products. Coatings of ALATHON resist oils, greases, acids, and alkalies. ALATHON stays flexible and strong at temperatures low enough to keep foods frozen and high enough for cooking. Strong, lasting heat seals can be made between films of ALATHON in the temperature range of 250° to 300°F., yet it shows little or no tendency to stick to other materials at temperatures below 200°F.

These attractive "cook-in" bags are only one of the packaging innovations made possible through the imaginative use of ALATHON polyethylene resin. For more complete information on the versatile properties of ALATHON, and how they can make a better package for your product, simply clip and mail coupon.

There is a difference in polyethylene resins – specify an **ALATHON®** *for your packaging needs*

DU PONT
ALATHON®
Polyethylene Resin
BETTER THINGS FOR BETTER LIVING

E. I. du Pont de Nemours & Co. (Inc.), Polychemicals Department
Room 8110, Du Pont Building, Wilmington 98, Delaware
In Canada: Du Pont Company of Canada Limited, P. O. Box 660, Montreal, Quebec

MAIL TODAY FOR ALL THE DETAILS

Please send me more information on Du Pont ALATHON polyethylene resin. I am interested in evaluating this material for:

_____
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Name _____
Position _____
Firm Name _____
Street Address _____
City _____
State _____
Type of Business _____

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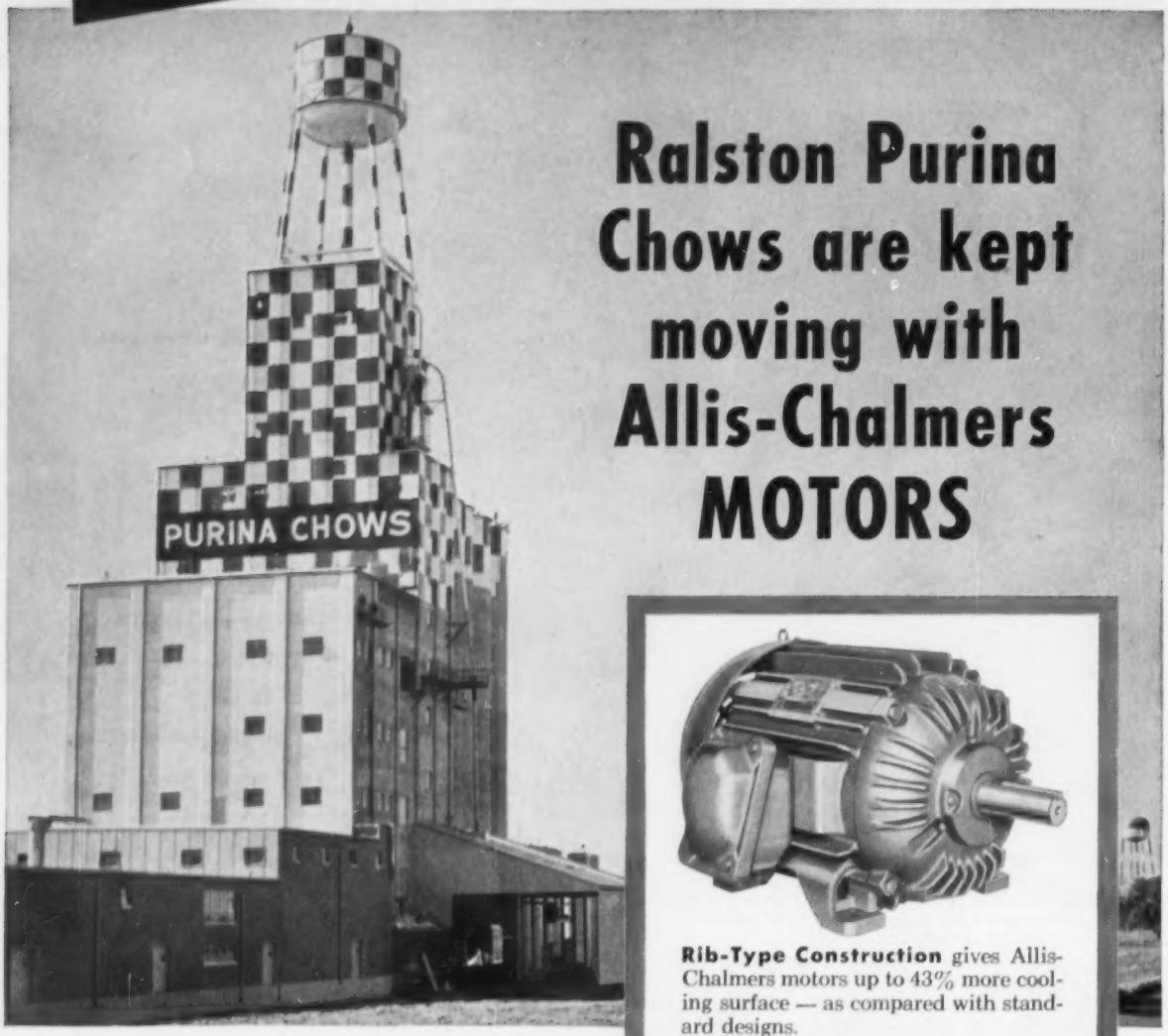
There's MORE **Mill Output with Rib-Type MOTORS**



Ralston Purina Chows are kept moving with Allis-Chalmers MOTORS

Rib-Type Construction gives Allis-Chalmers motors up to 43% more cooling surface — as compared with standard designs.

The Ralston Purina Company, long noted for its high quality products and modern processing methods, uses a large number of Allis-Chalmers motors in its Harrisburg, Pennsylvania, chow plant.

Throughout the industry, efficiency-minded millers are specifying Allis-Chalmers motors for a variety of uses—indoors and out. The reason:

Continuous Operation!

● Deep-ribbed frame means efficient cooling. Quickly swept clean of accumulated material — no external air passages to clog. It's hard for mill dust to "suffocate" A-C motors.

● Bearings protected from dust by external rotating seal. Provision for easy relubrication while in service.

● Liberal use of copper means top performance.

To find out more about the MORE in Allis-Chalmers motors, contact your nearby Allis-Chalmers sales office or distributor, or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

LIVE BETTER ELECTRICALLY

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

A-5036

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FIT TO BE TIED

Genuine Roche vitamins are tied like this, in original, unopened containers that sign, seal, and deliver them from the Roche plant to you. The seal you see is our guarantee. It is tamperproof . . . it is a lock.

It locks in the Roche reputation. It assures you of vitamin purity and potency—tested, analyzed, the finest. It protects a product that has been produced under rigid Roche control with maximum regard for quality. It's the follow-through, from us to you, of what Roche science and skill have made. *Fit To Be Tied*, our honest vitamin pledge.

You see, we want to see that you always get vitamins *right*, from Roche.

ORDER *right* . . . ORDER *from Roche*

ROCHE

Vitamin Division • Hoffmann-La Roche Inc.
Nutley 10, New Jersey • NUtley 2-5000 • New York: OXford 5-1400

VITAMINS BY THE TONS from ROCHE PARK

A trip around Roche Park is like a visit to fantasy land. The chemical manufacturing area is characterized by giant vats, 4-story distillation columns, myriads of piping, a model "tank farm" for solvent storage. Some of the buildings pictured are centers for chemical research, pharmacological and medical research, toxicology, applied nutrition, pharmaceutical manufacture and administration.

In the fields of medicine and nutrition the trade mark 'Roche' symbolizes tops in quality, experience and integrity. Some 2000 employees work here in this 104-acre area, much of which is still in woodland and gardens.

The Roche Vitamin Division supplies large quantities of most of the important vitamins to other pharmaceutical manufacturers who convert them into dosage forms. In addition, it has become a headquarters for the pure vitamins required by the food industries – A for margarine, B_1, B_2, and Niacin for cereal enrichment, C for the standardization of fruit juices as well as an important antioxidant for use with cured meats, frozen fruits and beverages.

Several vitamins were first synthesized by Roche scientists. Most recent of these has provided pure beta carotence for safe coloring of margarine, shortening, and other food products. The company is a leader in commercial scale application of these processes for the benefit of mankind.

Ascorbic Acid U.S.P.
Sodium Ascorbate
Coated Ascorbic Acid
Thiamine U.S.P.
Riboflavin U.S.P.
Riboflavin-5'-Phosphate
Pyridoxine U.S.P.
Vitamin A
Dry Vitamin A
Beta Carotene
Vitamin E
Biotin
Niacin U.S.P.
Niacinamide U.S.P.

Vitamin Division

HOFFMANN-LA ROCHE INC.

Nutley 10, New Jersey • NUtley 2-5000 • New York City: OXford 5-1400

Pacific Coast distributor: L. H. BUTCHER Company • San Francisco • Los Angeles • Seattle • Portland • Salt Lake City

In Canada — Hoffmann-La Roche Ltd., 286 St. Paul Street, West • Montreal • Quebec

How to lower the cost of elevating your material

DESIGNED FOR LIGHT, FREE-FLOWING MATERIALS. Has welded steel, dust-tight casings.

Boot shaft furnished with gravity takeups on elevators having 50-foot centers or more. Elevators have steel buckets mounted on belt. Curved hood is designed for proper discharge of material.

FOR LIGHT, FRIABLE OR SLUGGISH MATERIALS. Buckets mounted on double chain strands.

POPULAR FOR A RANGE OF MATERIALS. Has fixed head shaft, screw type boot shaft takeup.

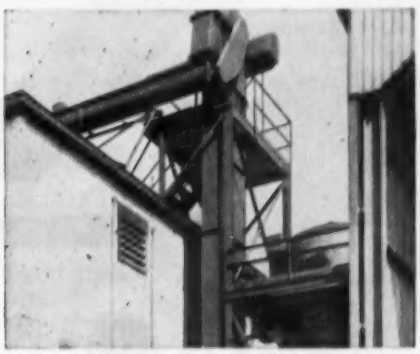
FOR CRUSHED MATERIALS with lumps less than ½". Fixed boot shaft, adjustable head shaft.

LINK-BELT will recommend the right bucket elevator to meet your requirements

THERE'S no surer way to reduce the cost of raising your materials than getting the right elevator for the job. And that's why the broad Link-Belt line of elevators is so vital to you. Our engineers can choose the right elevator designed with regard to your layout and capacity requirements. What's more, the complete Link-Belt line of elevator buckets assures a specific answer to the nature of your material.

There are so many considerations to be met in providing the ultimate in elevating efficiency that it's wise to call in Link-Belt while in the design stages of a new plant. We'll correlate all factors—including proper buckets and spacing for clean pickup and discharge . . . the right takeup . . . correctly designed hood to prevent back-legging. And with Link-Belt, you get design advancements that minimize installation, operating and maintenance costs.

You can reach an experienced materials handling engineer at your nearest Link-Belt office. Call today for full information.



Soybean meal from receiving tank is carried up to roof and delivered to six meal storage rooms by Link-Belt bucket elevator and screw conveyor system.

LINK-BELT

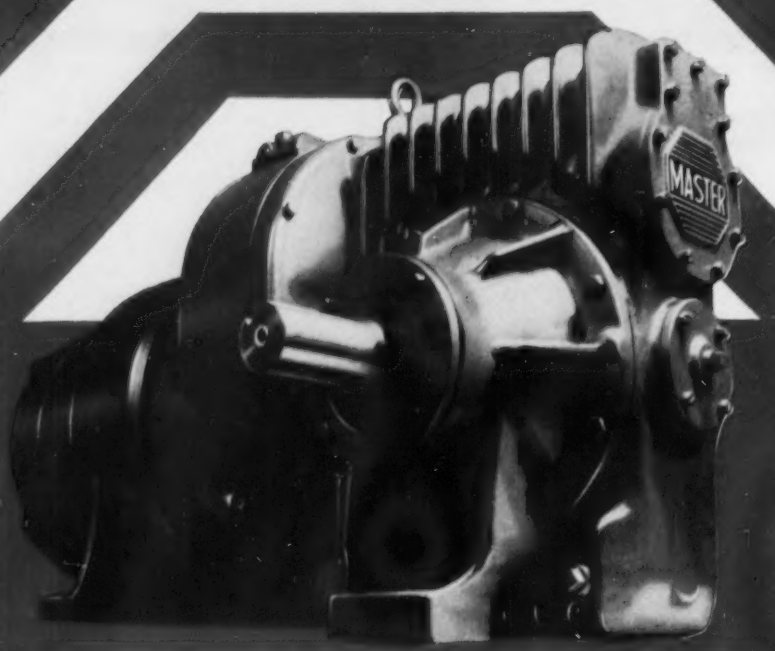
BUCKET ELEVATORS 19.798

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

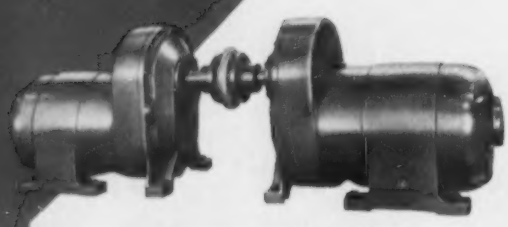
MASTER

still the All-American First

Master Gearmotors have given more millions of hours of satisfactory service in the field than all other makes combined.



CONTINUOUS LIFE TESTING
MAINTAINS
CUSTOMER SATISFACTION



How can *we* help YOU?

For five years without stopping, these two 326 frame single reduction gearmotors were run continuously 24 hours a day at full load, one as an induction generator, the other as a gearmotor. When shut down and inspected, Master's conservative design showed *gear wear of less* than .001".

THE MASTER ELECTRIC COMPANY • Dayton 1, Ohio

ONLY FLAVORS OF PROVEN PERFORMANCE can meet the exacting requirements of present day candy manufacture. Here, as with all other segments of the flavor-using food and beverage industries, FRITZSCHE has applied its specialized skills to the development of flavors precisely tailored to the practical requirements of every type of product. Remember: *Your product is* ONLY *as good as its* FLAVOR!

For aid in solving any flavoring or seasoning problem, write our Flavor Division, Dept. FE.

FRITZSCHE *Established* 1871

Brothers, Inc.

PORT AUTHORITY BUILDING, 76 NINTH AVENUE, NEW YORK 11, N. Y.

BRANCH OFFICES *and* *STOCKS: *Atlanta, Georgia, Boston, Massachusetts, *Chicago, Illinois, Cincinnati, Ohio, *Los Angeles, California, Philadelphia, Pennsylvania, San Francisco, California, St. Louis, Missouri, Montreal and *Toronto, Canada and *Mexico, D. F. FACTORY: Clifton, N. J.

For more data, circle this page number on card at back →

"polyethylene bags have

raised our bakery sales 35%"

"Polyethylene seals in goodness and flavor even after a loaf is started. The open end can be twisted and folded under, keeping the bread moist and tasty until the last slice is used." Albertson's packaging is supplied by **The Dobeckmun Co.**, Cleveland 1, Ohio.

That is how Dean Brown, supervisor of 25 "Dutch Girl" bakeries (associated with Albertson Super Market chain, Boise, Idaho), sums up the dollars and cents results of packaging in film made of BAKELITE Brand Polyethylene.

"There are so many advantages to polyethylene. It makes a neat wrapper. Our bread shows up clearly . . . all the color of the inviting crust is there. Every slice can be seen. Women can touch, lift, see and feel the lightness and freshness of the product before paying for it . . . and without harming its appearance or sealed-in cleanliness.

"Another advantage: polyethylene bags do not dry out and become brittle with age. Albertson's, with their thirty-four bakeries, can lay in a huge supply, saving money by large economy orders, and there is no danger of bags drying and cracking."

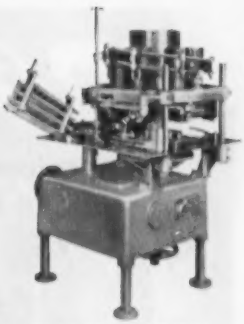
Investigate how packaging in film made of BAKELITE Polyethylene can help *your* business. Call your packaging supplier, or write for "Processed Foods Packaging" booklet to Dept. UN-63.

It pays to package in film made of

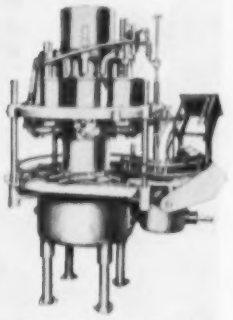
BAKELITE
BRAND
Polyethylene Plastic

BAKELITE COMPANY, *A Division of Union Carbide and Carbon Corporation* UCC 30 East 42nd Street, New York 17, N.Y.

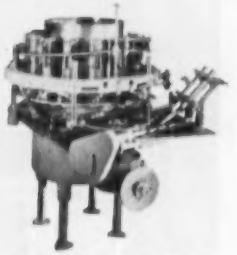
The term BAKELITE and the Trefoil Symbol are registered trade-marks of UCC



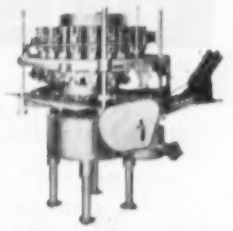
Model RP-6 Six Stations



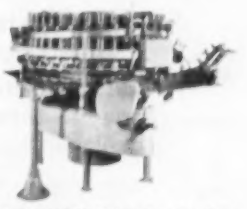
Model RP-7 Seven Stations



Model RP-14 Fourteen Stations



Model RP-21 Twenty-one Stations



Model RP-35 Thirty-five Stations

Look at what any *one* of these 5 fillers can do for you

If your problem is packaging *viscous* or semi-solid products, it's a safe bet that one of these Pfaudler rotary piston fillers will best solve it.

Pfaudler offers you—not one, but *five*—fillers to choose from. Each model is a little different from the others, of course, but they all give you these same advantages:

Faster Filling. There's no stop and go—containers flow through the filler continuously. This smooth container handling makes possible faster operation without spillage. Speeds range from 40 to 600 containers per minute, depending on filler model, container size, and product.

Low Operating Cost. Pfaudler piston fillers pay for themselves in a short time because they fill more cans per minute with lower total operating costs than other equipment.

Easy Cleaning. You don't need a single tool to clean the filler. Only the valves and pistons have to be removed – and the procedure for that is simple. One man can perform the entire cleaning operation in less than *thirty minutes.*

Built-in Container Protection. Your containers are kept in the best possible condition by polished handling surfaces, continuous motion, precise timing, and safety releases.

If you check your food packaging problem against all five Pfaudler models, you'll find *four* fillers that are almost what you want—*and the one filler that's just right for you.*

For more detailed information, contact your Pfaudler representative. Or write directly to us. Just ask for Bulletins 911 and 911-S.

THE PFAUDLER CO. Pfaudler **ROCHESTER 3, N. Y.**

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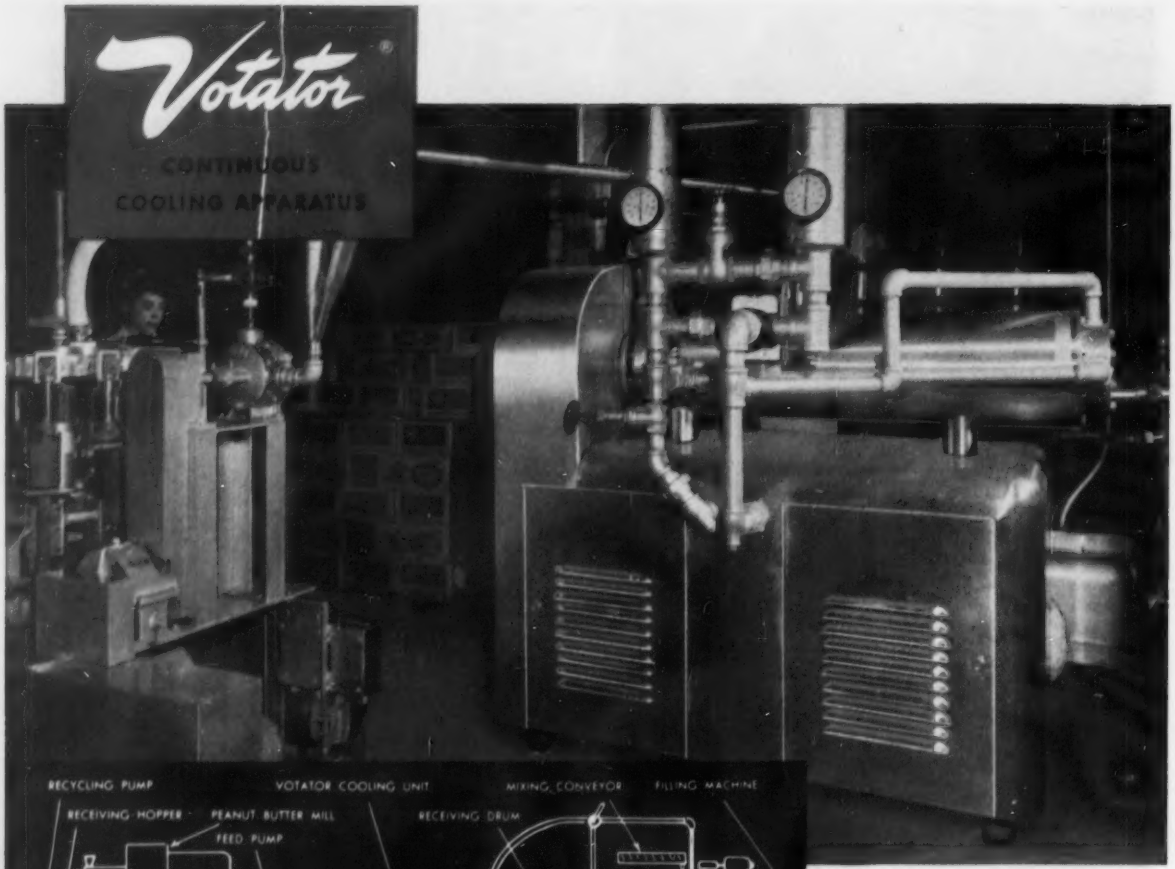

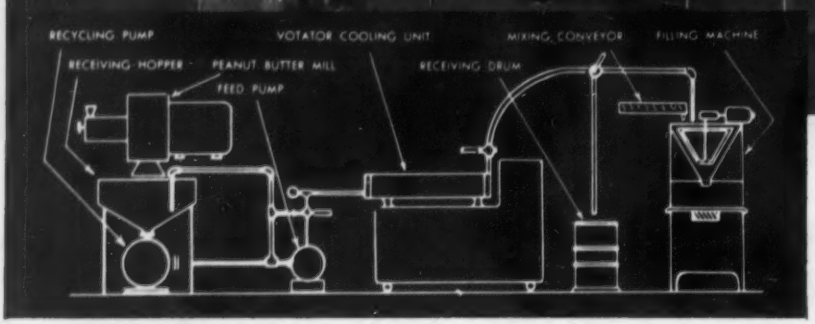

Installation of VOTATOR Peanut Butter Processing Unit at Bell Brand Foods, Ltd., Los Angeles.

Schematic flow chart for peanut butter processing.

Stabilizes and improves spreadability of peanut butter

MANUFACTURERS of peanut butter report these benefits of continuous cooling with VOTATOR* Heat Transfer Apparatus:

More Salable Product. Eliminates problem of separation. Improves smoothness and spreadability.

Absolute Uniformity. Precise control of processing temperature, pressure and output assures uniform high quality . . . pound after pound.

Low Cost Production. Operation is continuous, rapid. Eliminates after-cooling storage; saves space.

Sanitary. Closed system prevents air contact during chilling, protects against contamination.

Bulletin V243 gives complete details. Free on request.

Investigate VOTATOR Processing Apparatus for cooling, cooking, mixing of many food products.

*VOTATOR—Trade-Mark Reg. U. S. Pat. Off.

The GIRDLER Company

A DIVISION OF NATIONAL CYLINDER GAS COMPANY

VOTATOR DIVISION • LOUISVILLE 1, KENTUCKY

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Stays with Gelcarin*

As a thickening or jelling agent, pure odorless, tasteless **GELCARIN** does just that. Absolutely *no* masking of taste is possible when you use **GELCARIN.** • The quality of your raw materials, manufacturing processes, packing and shipping is carefully controlled to provide the best. Why risk masking any of this flavor with a colloid less than **GELCARIN?** • **GELCARIN'S** unique processing techniques and quality control assure highest purity, greatest refinement, uniform quality — and results you can count on every time.

GELCARIN®

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Our specialized laboratory facilities and technical personnel are available for consultation without charge or obligation. Contact any of our offices: 24 State St., N. Y. 4; • 600 S. Michigan Ave., Chicago 5; • 2024 Westgate Ave., Los Angeles 25.

*Gelcarin is the registered trade name for a series of highly refined carrageenates manufactured by Algin Corporation of America.

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Do you have a problem in viscosity building, gelation, stabilization, or suspension? We will be glad to send you a free sample of **GELCARIN** and our booklet fully detailing its properties. Just mail the coupon today.

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☐ *Free descriptive literature* ☐ *Free Sample of* GELCARIN

In order to send you the GELCARIN in our series that will be applicable to your needs, we need the following information which will, of course, be kept strictly confidential:

1. *Will it be used in water?____ milk?____ hot?____ cold?____*
2. *Do you want to: increase viscosity?____ gel?____ stabilize?____*
3. *Approximate pH of your product?____*
4. *We would appreciate knowing the end use you plan for this product. (It is not necessary to include this information in order to receive your free sample.)____*

Name____ Title____

Company____

Address____

City____ Zone____ State____

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Why Famous Brands Agree . . .

More Sales Power Per Package

*Remember, Waxed Glassine is *more* than a wrapper. It billboards your brand, merchandises itself, sells itself. Waxed Glassine is an advertisement with genuine appetite appeal. In fact—*it's an appetizement!*

WAXED PAPER MERCHANDISING COUNCIL, INC.

..with WAXED GLASSINE

New distinction in modern low cost display packaging! Unmatched shelf appeal that means ready sales! Waxed Glassine safeguards product freshness and quality, assures whole-hearted consumer acceptance of Your Brand!

THE POWER OF WAXED GLASSINE OUTER WRAPS:*

- **More eye appeal** Sparkling clean surface provides perfect background for brilliant, contrasting colors, makes the most of appetizing illustrations, lets you use entire package for powerful all-over sales-winning designs that prompt purchase by brand! Waxed Glassine comes in many weights, many colors—one just right for the job in mind!
- **Billboards your brand** Every package is a *billboard* in the store and in the home, generating impulse sales and assuring repeat customers with its fresh, inviting look, strong appetite appeal, stand-out brand identification and proven selling features!

INNER AND OUTER WRAPS OF WAXED GLASSINE:

- **Extra flavor protection** Safely seals in all that desirable just-made goodness, keeps customers coming back for more. And satisfied shoppers mean satisfied retailers!
- **Extra freshness protection** Self-sealing Waxed Glassine protects against moisture invasion, maintains freshness and texture best for longer shelf and pantry life. Easier to open, easier to reclose, contents keep fresh and tasty for the life of the package!
- **Extra grease protection** Waxed Glassine wrappers resist penetration by fats, oils, shortenings. No more rancidity problems! Your package stays clean, inviting, colorful!
- **Extra strength** Waxed Glassine passes every rugged test of delivery, in-store and consumer handling! Made stronger to stack better, it cuts down crumbling, breakage, ripped wrappers and returns that shrink your profits!
- **Low cost** Lower basic costs plus constant, dependable supply combine with other Waxed Glassine advantages to produce a package that reaches out and sells! Result: increased *net* profits for you!

Waxed Glassine teams up with the experience, facilities and service of the nation's top converters, to give you modern packaging and product protection that pays off in bigger packaging business—and the job doesn't stop here!

Traffic-stopping *designs*, actual *samples*, proven *sales ideas*, complete *cost sheets* show how Waxed Glassine pays off in better packaging, higher brand profits! See your Waxed Paper salesman, or write or telephone us direct.

W
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P

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Simplest pneumatic controller to use and maintain

Bristol gives you improved stability of control action –but keeps basic simplicity of Series 500 Controllers

Bristol Series 500 Pneumatic Controllers are the easiest controllers on the market to use and maintain–still the most dependable and trouble-free.

The reason? The basic simplicity of the operating mechanism. *That* hasn't changed in the years since we introduced this long-time favorite among instrument men. Reason No. 2: they are equipped with famous Bristol measuring elements.

Easy calibration

It's this foolproof simplicity of the control system that makes calibration so easy on Series 500 controllers. *Only one* service adjustment is required and provided to exactly calibrate the control system. The control system can be completely disassembled and after reassembly (even with replacement of parts) can be restored to precise calibration with this *one* adjustment.

No special tools are required. A ¼-inch wrench is all that's needed.

The 500's completely interchangeable parts, accurately designed and manufactured to extremely close tolerances, make possible this built-in calibration.

And check these features:

Improved control stability—advanced automatic control techniques have been applied by Bristol engineers to improve stability of control action in the new Series 500W Controllers.

Wide-band models offer choice of ½ to 400% proportional band with simple band shift.

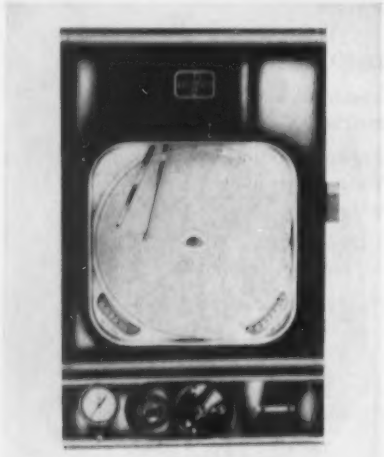
True zero derivative setting—exclusive with Bristol.

Reset action stops in reset models—again a Bristol exclusive—prevent loss of control due to prolonged deviation from set point.

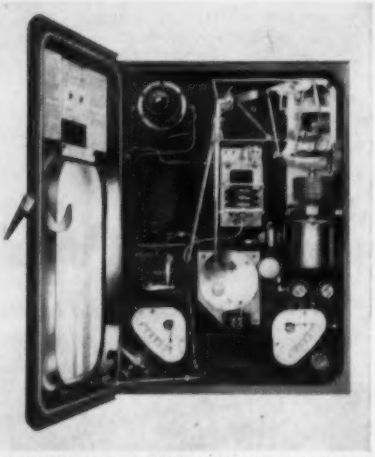
Four-position internal transfer station with automatic, manual, test, and service positions, plus pressure-matching button and manual pressure regulator, for maximum convenience in process control.

Complete data available

Write today for engineering data on Bristol's Series 500 controllers for your critical control problems. They're available for *automatic control of temperature, pressure, vacuum, draft, absolute pressure, liquid level, humidity, pH value, electrical measurements, and mechanical motion.* The Bristol Company, 115 Bristol Road, Waterbury 20, Conn.



BRISTOL'S® SERIES 500 CONTROLLER, shown here with four-position transfer station. Internal station also available.



FOUR-POSITION INTERNAL TRANSFER STATION shown here in interior view of Series 500 Controller. Permits remote manual control, testing and servicing without disconnecting instrument.

YOU CAN GET THESE CONTROL MODES:

1. **Fixed narrow band** (on-off)
2. **Proportional band**—½ to 100% and ½ to 30%.
3. **Reset with wide band**—rates 0.1 to 10 or 1 to 300 repeats per minute. Proportional band ½ to 400%.
4. **Derivative (rate)**—½ to 100% proportional band. Derivative time 0.2 to 20 min., plus zero derivative setting.
5. **Reset plus derivative**—proportional band and reset rate as in "reset" above. Derivative time as in "derivative" above.

YOU CAN HANDLE THESE CONTROL PROBLEMS:

1. Cascaded control 2. Selective control 3. Ratio control 4. Time-program control 5. Pneumatic transmission.

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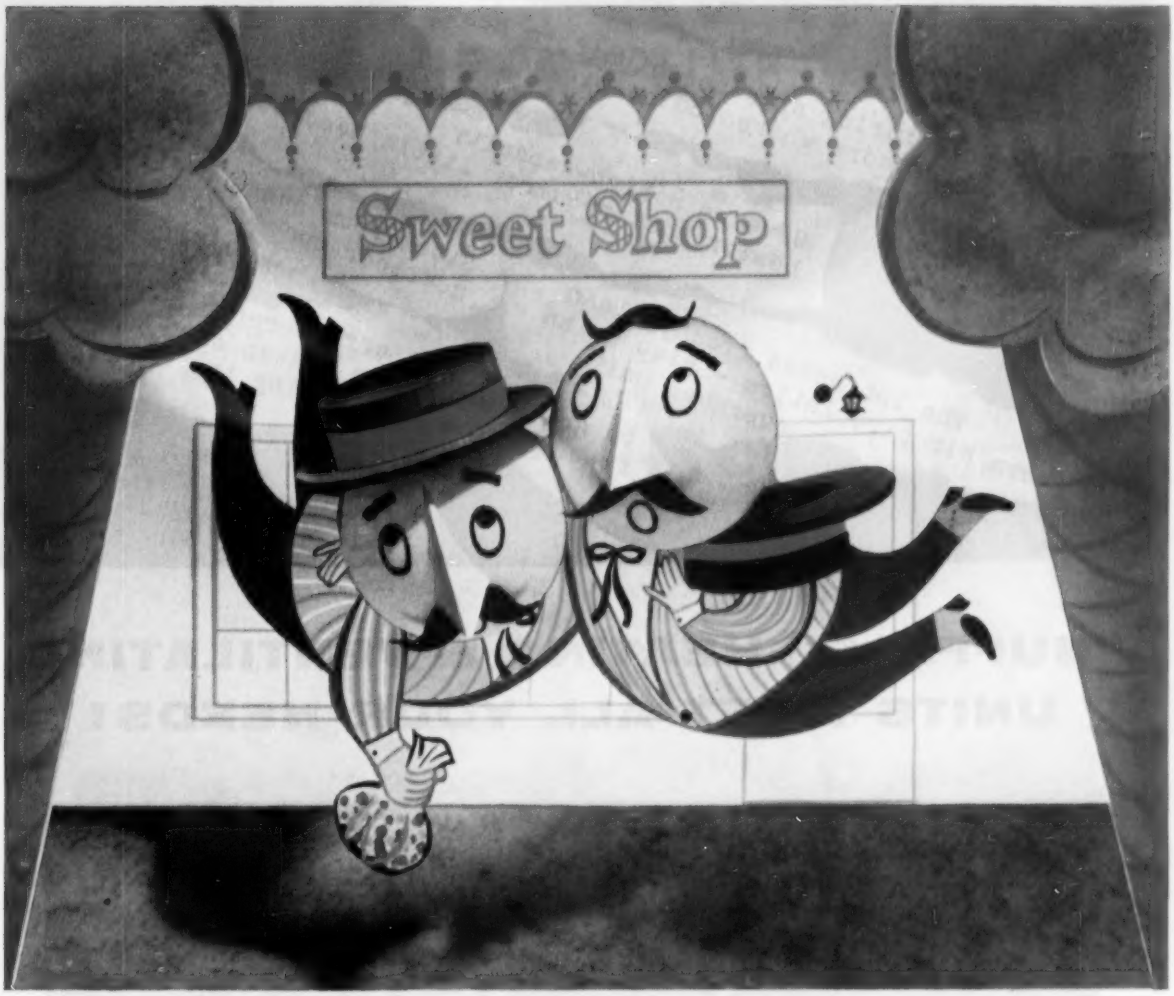
BRISTOL *TRAIL-BLAZERS IN PROCESS AUTOMATION*

AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS



Harmony for sweet sales:

Palatone and Cyclotene

Dow flavor intensifiers work well separately or together—giving added sales-appeal to ice cream, baked goods, candy and flavors!

Music to your ears! Referring, of course, to the sales reports you'll hear when you use Palatone® and Cyclotene® in your products. Both of these Dow aromatics accent flavor—and sales—appeal!

Palatone is one of the rare flavor materials whose aroma closely resembles its taste. Its distinct caramel-butterscotch odor emphasizes the sweetness of most blends. Palatone is also successful in compounding rich vanilla and chocolate flavors.

Palatone and Cyclotene work very well together as flavor intensifiers. Cyclotene has a maple-licorice flavor, with a suggestion of walnut, which highlights the customer appeal of ice cream, baked goods, candy, tobaccos and peanut products.

New Dow technical bulletins and samples are yours for the asking. You'll be sales ahead by writing on your letterhead to THE DOW CHEMICAL COMPANY, Midland, Michigan, Dept. AR 871D-1.

you can depend on DOW AROMATICS

DOW

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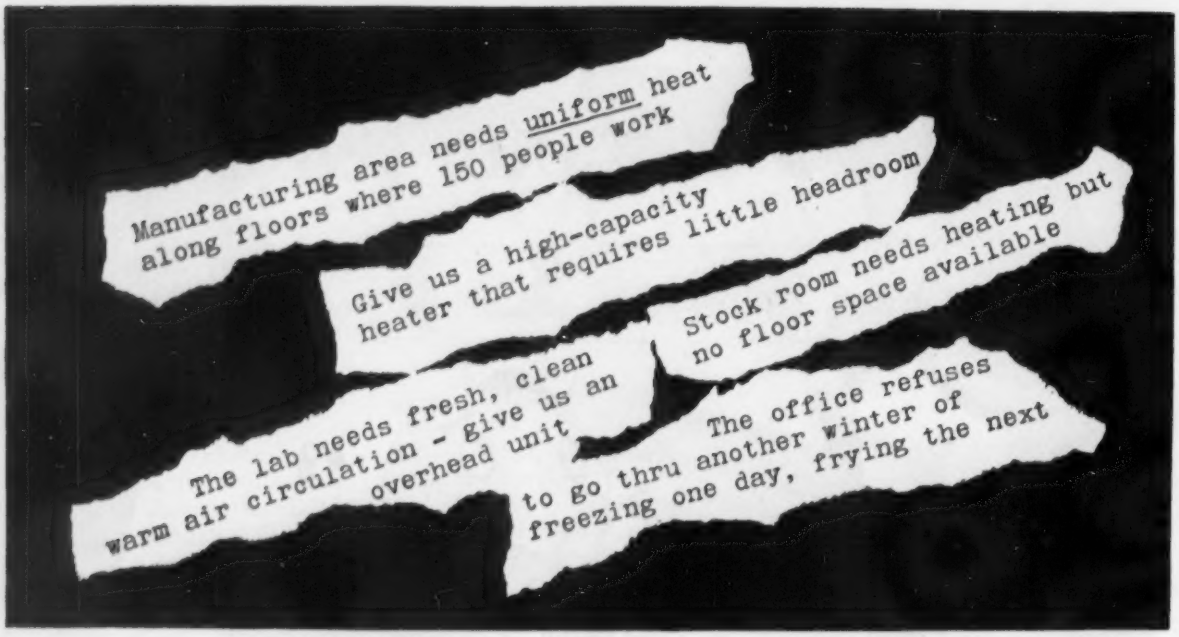
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Give us a high-capacity heater that requires little headroom
Stock room needs heating but no floor space available
The lab needs fresh, clean warm air circulation - give us an overhead unit
The office refuses to go thru another winter of freezing one day, frying the next

"BUFFALO" HEATING & VENTILATING UNITS MEET ALL YOUR NEEDS!

FILTERS—HEATS—VENTILATES This Highboy Unit hugs the wall, using little space — delivers makeup air from the outside thru filtered intake. Note fan bearing bowl on left for handy external lubrication.

LOW HEADROOM? Compact wall-mounted "Buffalo" Units deliver plenty of heat in cramped machinery areas. The secret — non-freeze coils of high heating surface, efficient "Buffalo" Fans to distribute the heat where you need it.

NO FLOOR SPACE? A "Buffalo" Lowboy mounted overhead is the answer. Exclusive "Buffalo" swivel outlets aim air accurately. Unit has filters, face and by-pass dampers and mixing box for fresh and return air.

IT PAYS TO BUY QUALITY!

For no-complaint heating and ventilation, season after season, there is no substitute for the engineering and manufacturing Quality that have always gone into "Buffalo" Unit Heaters. For contractors, this means "no-callback" customer satisfaction; for users, reliable, low-cost comfort and better working conditions. Write today for Bulletin 3704A for details. Capacities up to 35,000 cfm.

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VENTILATING AIR CLEANING AIR TEMPERING INDUCED DRAFT EXHAUSTING FORCED DRAFT COOLING HEATING PRESSURE BLOWING

5 WAYS TO FORTIFY MARGARINE WITH **PFIZER** PURE **VITAMIN A**

● The best way you can fortify your margarine is the way that fits into your production most easily . . . and adds maximum nutritional value without affecting taste or odor.

Pfizer has a product to fill your needs exactly—Pfizer Pure Crystalline Vitamin A Acetate or Palmitate in vegetable oil.

In addition to bulk packaging, it is available in batch-size cans (100,000-500,000 U.S.P. units per gram) in any one of five different, convenient formulations:

1. Straight Vitamin A Acetate or Palmitate dissolved in refined winterized cottonseed or corn oil (no color added.)

2. Vitamin A plus Vitamin D (with or without any of the three coloring agents below.)

3. Vitamin A with Pfizer Beta Carotene (a stable, nutritional coloring agent that imparts a uniform, true natural color.)

4. Vitamin A with Pfizer Vegetable Color (The latter is an oil-soluble 20% suspension of microcrystalline annatto color.)

5. Vitamin A with F.D. and C. color added (5 BU or more only.)

Pfizer combination vitamin and color products can be pre-blended to your specifications, so that you can fortify and color with maximum ease and best results. You will find Pfizer Vitamin A odorless, tasteless and highly stable. Count on Pfizer, a leader in vitamin research and development, for products of uniform high quality in convenient forms.

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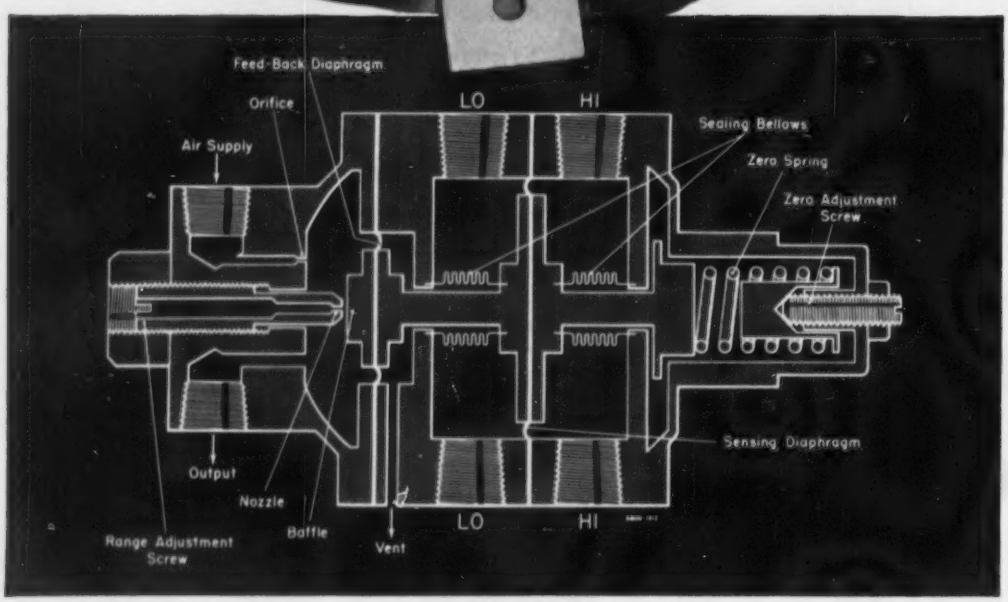
Taylor Presents

ACTUAL SIZE 6½" x 3"

No. 200TD111



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NEW LOW COST FLOW TRANSMITTER

The new Taylor Fixed Range Differential Pressure Transmitter (200TD111) provides an excellent, economical means of measuring flow, liquid level, or pressure. A 3 to 15 psi signal is transmitted to an indicating, recording or controlling receiver with an accuracy of 1%. Its remarkably low price makes it a practical cost accounting aid for many applications previously considered marginal Check these features:

Simple to install. Piping is simplified because it can be close coupled to orifice flanges. Can be lead-line or bracket mounted. No seal pots required. Mercuryless, no leveling required. Force-balance construction means negligible displacement. 4½ lb. weight, 6½" x 3" size make it easy to handle.

Easy to maintain. External zero and range adjustments. Self draining or venting. Over-range to full working pressure with no permanent damage. Purges, if required, can be installed to keep body swept clean. Minimum number of parts.

Reliable accuracy. Calibration accuracy is better than 1%. Unaffected by piping or mounting stresses. No errors build up during operation because of self draining and venting feature. Pressure effect 2%/150 psi (100" range). Temperature effect 2%/100°F. (100" range). Sensitivity exceeds 0.1%.

Rugged and dependable. No stuffing box, levers or pivots. No relay valve. Compact, weatherproof, built for rough service and outdoor mounting.

Adaptable. Ranges 0 to 50, 100, 200 and 300 inches of water—easily and quickly changed by substitution of range ring and diaphragm.

No. 200TD111, Fixed Range Differential Pressure Transmitter. Immediate Delivery from Stock.

Call your Taylor Field Engineer to discuss possible applications for this remarkable new instrument in your plant. And write for **Bulletin 98274.** Taylor Instrument Companies, Rochester, N.Y., or Toronto, Canada.

DESIGN SPECIFICATIONS

Diaphragm of Neoprene impregnated Nylon.
Body material brass.
Maximum working pressure 150 psi.; temperature 150° F.
Air Supply pressure, 20 psi.
Air consumption, 0.10 standard cu. ft. per minute.
Output pressure range 3 to 15 psi.
Size 6½" x 3", Weight 4 lbs. 9 oz.
All connections ¼" internal NPT.

Taylor Instruments
MEAN
ACCURACY FIRST
IN HOME AND INDUSTRY

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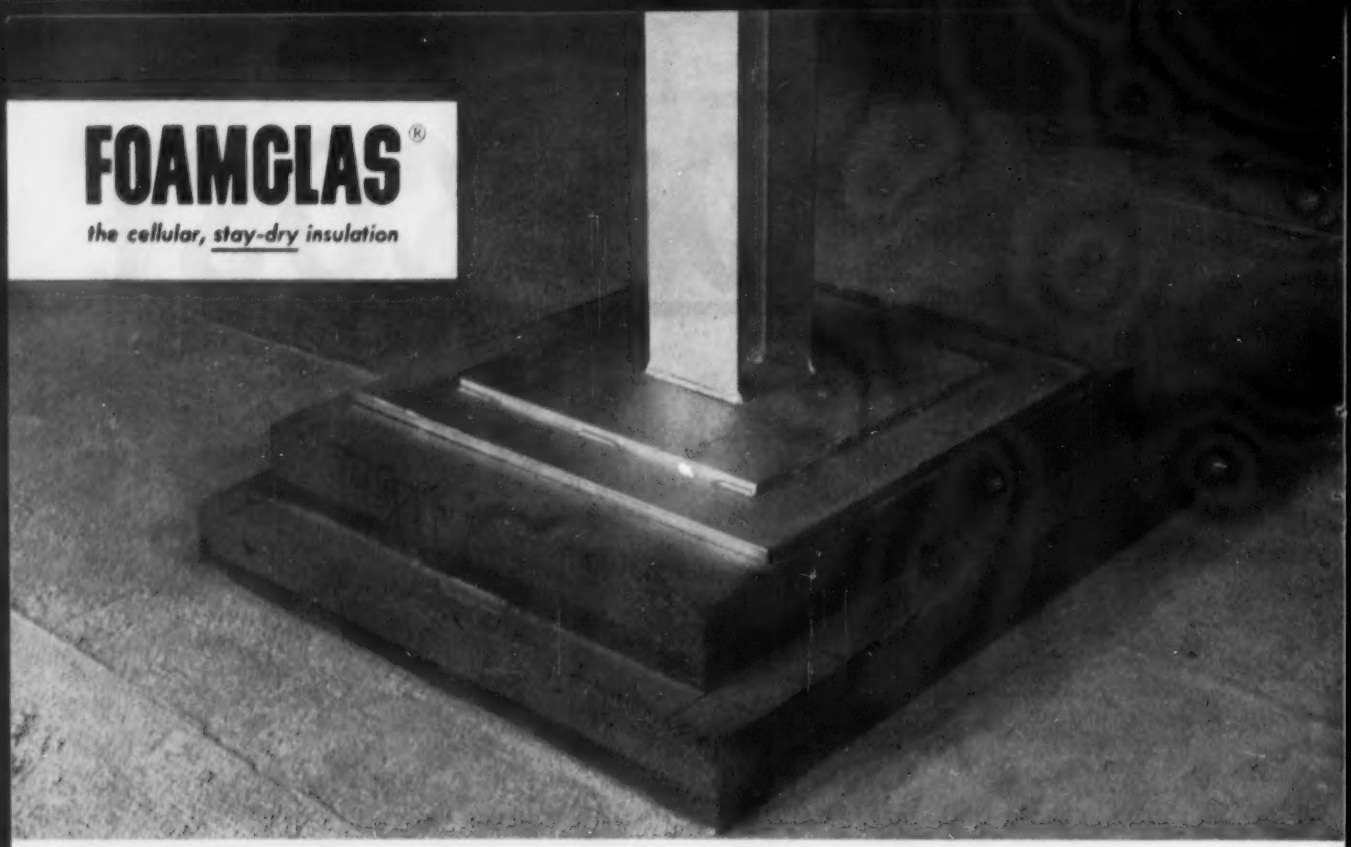
FOAMGLAS®

the cellular, stay-dry insulation



President Carl Steimle of Southern Michigan Cold Storage says...

"The weight of our new warehouse actually rests on FOAMGLAS floor insulation"

"FOAMGLAS floor insulation actually supports much of the weight of our new refrigerated warehouse." That's the report from Carl Steimle, president of Southern Michigan Cold Storage Company, Sodus, Michigan. They picked strong, stay-dry FOAMGLAS to insulate not only the floor, but also the roof, ceilings and all walls of the new building, first stage in a $1½ million building program.

This unique all glass insulation has a compressive strength of over 7 tons per square foot. Mr. Steimle says, "That made it possible to prevent thermal 'short circuits' by putting insulation *between* all load bearing columns and other structural members. All columns bear directly on FOAMGLAS without reducing its insulating performance."

FOAMGLAS can't absorb the moisture that cuts efficiency of other insulations. "The result," concludes Mr. Steimle, "is *constant*, precise control of temperatures (from —35 to +35F°), and we don't have the headache of recurring insulation replacement."

These benefits will be *yours* when you insulate your buildings, piping or equipment with FOAMGLAS. Prove it to yourself with six simple tests which you can perform in your own office. Write today for a free sample and complete testing directions.

Pittsburgh Corning Corporation

Dept. O-106, One Gateway Center
Pittsburgh 22, Pennsylvania

In Canada: 57 Bloor St. W., Toronto, Ontario

Two layers of 4" FOAMGLAS insulate the entire floor area. There are no thermal "short circuits" since all load bearing columns rest directly on this remarkably strong insulation (see close-up, above).

PC® Also manufacturers of PC Glass Blocks

COULD
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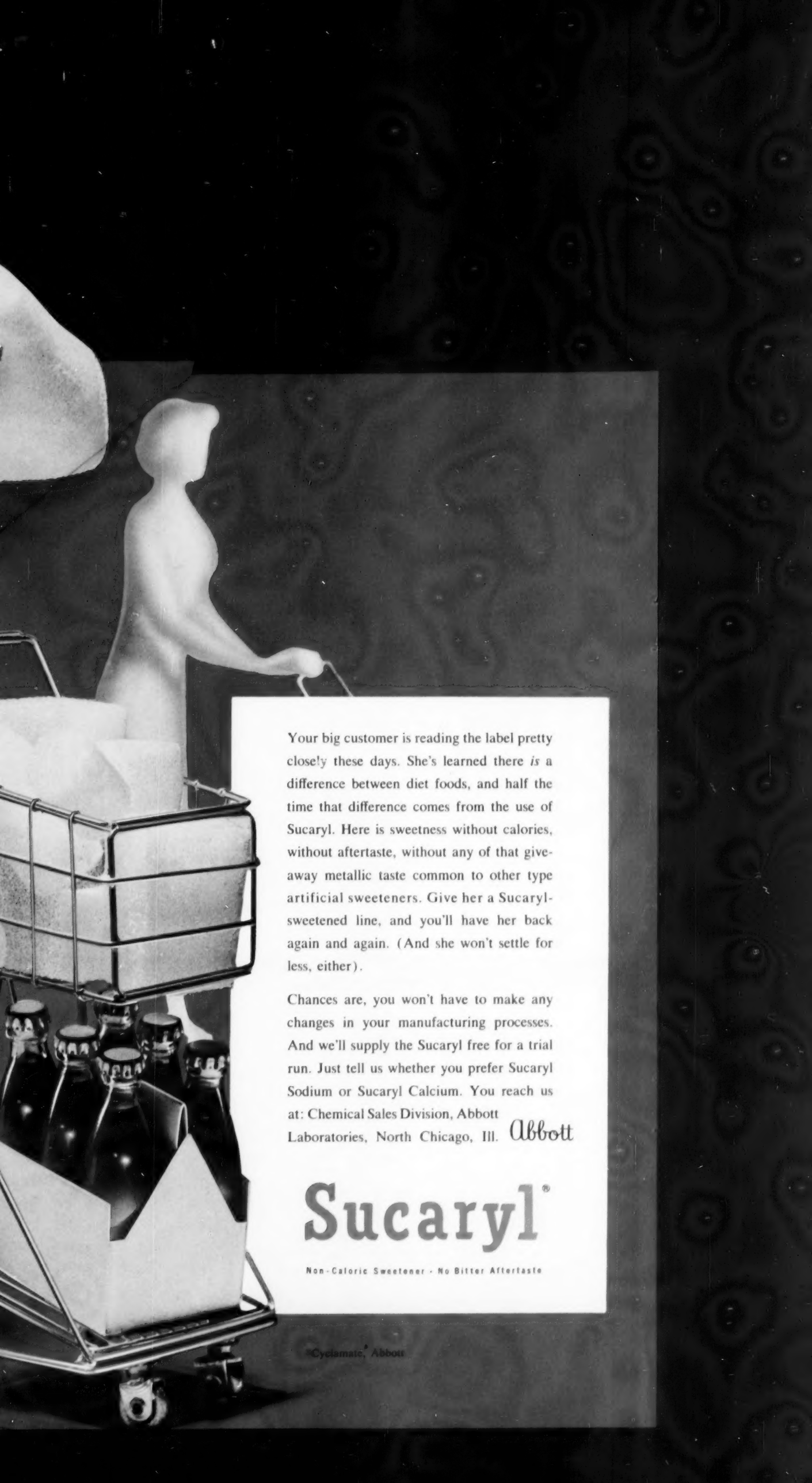
ANOTHER
CUSTOMER?



Your big customer is reading the label pretty closely these days. She's learned there *is* a difference between diet foods, and half the time that difference comes from the use of Sucaryl. Here is sweetness without calories, without aftertaste, without any of that give-away metallic taste common to other type artificial sweeteners. Give her a Sucaryl-sweetened line, and you'll have her back again and again. (And she won't settle for less, either).

Chances are, you won't have to make any changes in your manufacturing processes. And we'll supply the Sucaryl free for a trial run. Just tell us whether you prefer Sucaryl Sodium or Sucaryl Calcium. You reach us at: Chemical Sales Division, Abbott Laboratories, North Chicago, Ill. Abbott

Sucaryl®

Non-Caloric Sweetener · No Bitter Aftertaste

*Cyclamate, Abbott

You add a

BIG

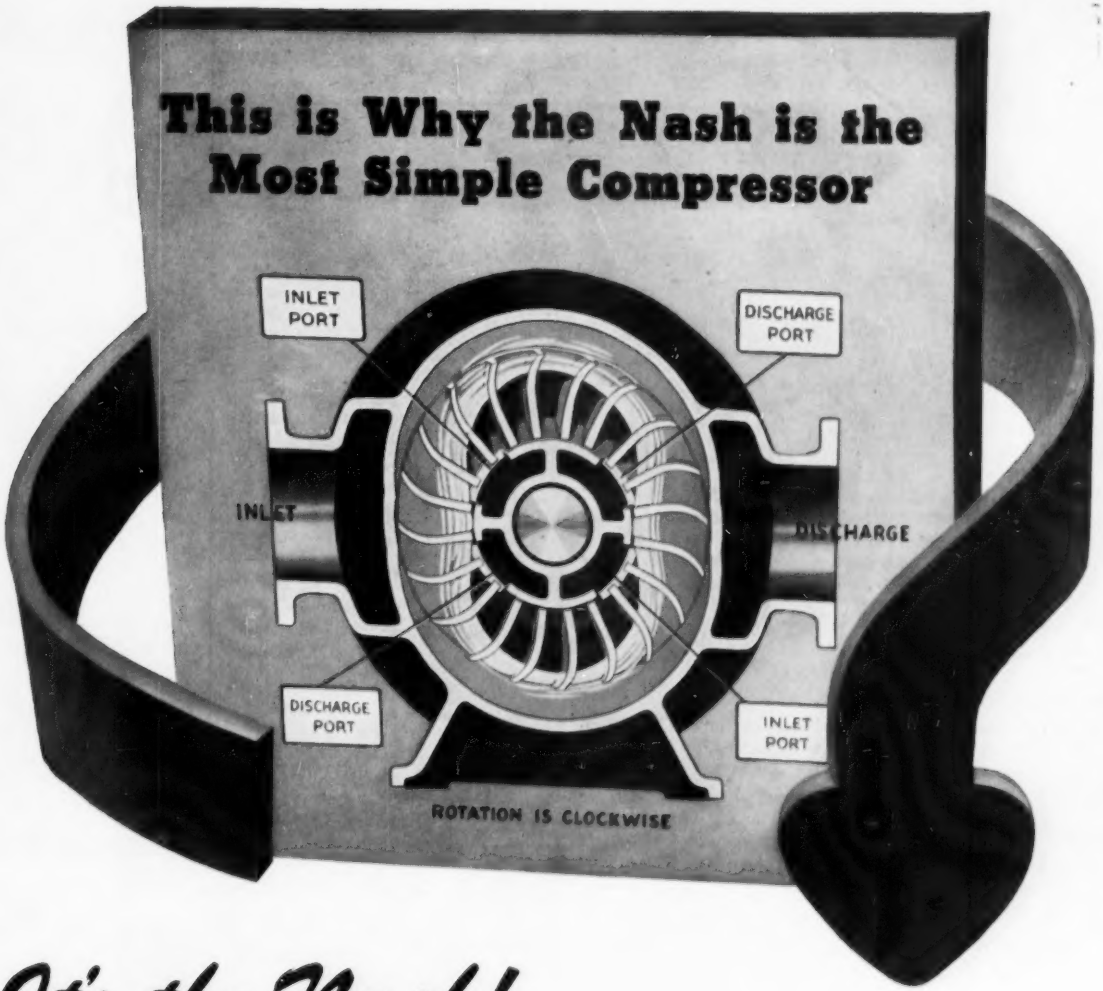
customer

when you add a

Sucaryl® **-sweetened**

dietetic line

This is Why the Nash is the Most Simple Compressor



It's the Nash!

There are no mechanical complications in a Nash Compressor. A single moving element, a round rotor, with shrouded blades, forming a series of buckets, revolves freely in an elliptical casing containing any low viscosity liquid. This liquid, carried with the rotor, follows the elliptical contour of the casing.

The moving liquid therefore recedes from the rotor buckets at the wide part of the ellipse, permitting the buckets to fill with gas from the stationary Inlet Ports. As the casing narrows, the liquid is forced back into the rotor buckets, compressing the gas, and delivering it through the fixed Outlet Ports.

Nash Compressors produce 75 lbs pressure in a single stage, with capacities to 6 million cu. ft. per day in a single structure. Since compression is secured by an entirely different principle, gas pumping problems difficult with ordinary pumps are often handled easily in a Nash.

Nash simplicity means low maintenance cost, with original pump performance constant over long periods Data on these pumps sent immediately on request

- No internal wearing parts.
- No valves, pistons, or vanes.
- No internal lubrication.
- Low maintenance cost.
- Saves floor space.
- Desired delivery temperature automatically maintained.
- Slugs of liquid entering pump will do no harm.
- 75 pounds in a single stage.

NASH ENGINEERING COMPANY
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(ADVERTISEMENT)

INSIDE SCIENCE

A New Chapter In
The Vital Story of Bread Enrichment

by Science Writer

Lighting 15 Candles

1956 is a milestone in the trend to nutritional improvement of processed foods. It marks the 15th Anniversary of white bread and white flour "enrichment" in the United States.

Back in the late 1930's millers and bakers began the restoration of vitamin B_1 to their foods. Later vitamin B_2, niacin and iron were included. Then in 1941 the concept of "enrichment" came into being: restoration of B_1, niacin and iron and fortification with a *higher* amount of B_1 than originally present in the wheat berry.

The baking and milling industries deserve the gratitude of the nation for thus insuring better foods for the nation's better health.

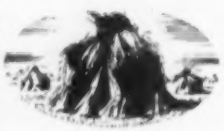
What Diet Experts Say

Physicians, dietitians, nutritionists, public health experts have supported enrichment from the start and continue to approve the practice. For example, a prominent public health nutritionist has said:

> *". . . my first and most important suggestion to you—continue not only to enrich your white bread but continue to promote enrichment until all white bread in the United States is enriched, and continue to tell the public repeatedly and more effectively about the nutritional value of enriched white bread."*

The U. S. Department of Agriculture credits the enrichment of white flour and bread for major improvements in the per capita daily food supply. Said the Department in the 1955 outlook issue of its publication "The National Food Situation"—"Enrichment and fortification of grain products continue to make an important contribution to the nutritive value of diets, especially in thiamine."

Why Enrich?



Americans want *white* bread to eat. Millers and bakers want *white* flour because it keeps better and bakes better. To produce this fine product, millers must process the grain to a high degree of whiteness—unavoidably milling out some values known to be necessary for good health.

Enrichment restores the important lost nutrients. It puts white flour and bread on a par with—in many cases actually ahead of—whole wheat products in their content of these factors which are necessary to good health and well-being:

Thiamine (vitamin B_1)	Niacin (another "B" vitamin)
Riboflavin (vitamin B_2)	Iron

What Values Do the Enriching Vitamins and Iron Have?

Thiamine is the vitamin which helps build physical and mental health. Essential for normal appetite, intestinal activity and sound nerves.

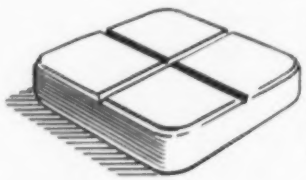
Riboflavin helps promote healthy body tissues and proper eye function.

Niacin is needed for healthy body tissues. Effective in treating and preventing pellagra.

Iron is the mineral used in enrichment. Essential for making good, red blood and in preventing nutritional anemia.

How Is White Bread Enriched?

Several methods may be used. In one, bakers use enriched white flour—flour which has been enriched at the mill according to federal definitions and standards of identity or state law.



Most bakers in the United States use a tablet or wafer. One of these contains enough thiamine, riboflavin, niacin and iron to enrich 100 lbs. of unenriched white flour—sufficient to produce 155 lbs. of white bread.

One popular form of wafer is known as "Square." Shown above in actual size, the "Square" wafer has many advantages for the baker.

Square wafers are distributed in two types by leading yeast companies throughout the United States:

Type A—for use in bread formulas requiring 3% or more non-fat milk solids.

Type B—for use in bread formulas requiring less than 3% non-fat milk solids.

How to Identify Enriched Bread

You can't tell enriched bread by its appearance or taste. If you live in one of the 27 states having laws requiring white flour and bread to be enriched you can assume you're getting these nutritionally improved products. But all packages of enriched flour, and all wrapped enriched white bread, must show the word "enriched." Look also for a declaration on your bread wrapper similar to this:

> 8 ounces of this enriched bread supply you with at least the following amounts of your minimum daily requirements for these essential food substances: Thiamine (vitamin B_1) 55%; Riboflavin (vitamin B_2) 17.5%; Niacin (another "B" vitamin) 5 milligrams; Iron 40%.

Wherever you go, insist on bread enriched with vitamins and iron for better nutrition—for better health—for better well-being.

Vitamins Are Made

While vitamins occur naturally in foods, most vitamins used in food processing are manufactured through the marvels of chemistry and engineering. At the huge Roche Park plant of Hoffmann-La Roche they are manufactured *by the tons*. Using amazingly complex processes with scientific production controls and intricate equipment, the Roche people produce pure vitamins that are equal chemically and in biological activity to Nature's own. So efficient are these operations that the vitamins are sold at lower prices than if they were extracted from natural sources.

This article is published as a service to the baking industry by a pioneer in enrichment—Hoffmann-La Roche Inc. Reprints are available on request without charge. Write to the Vitamin Division, Hoffmann-La Roche Inc., Nutley 10, New Jersey.

TEAR OUT AND FILE

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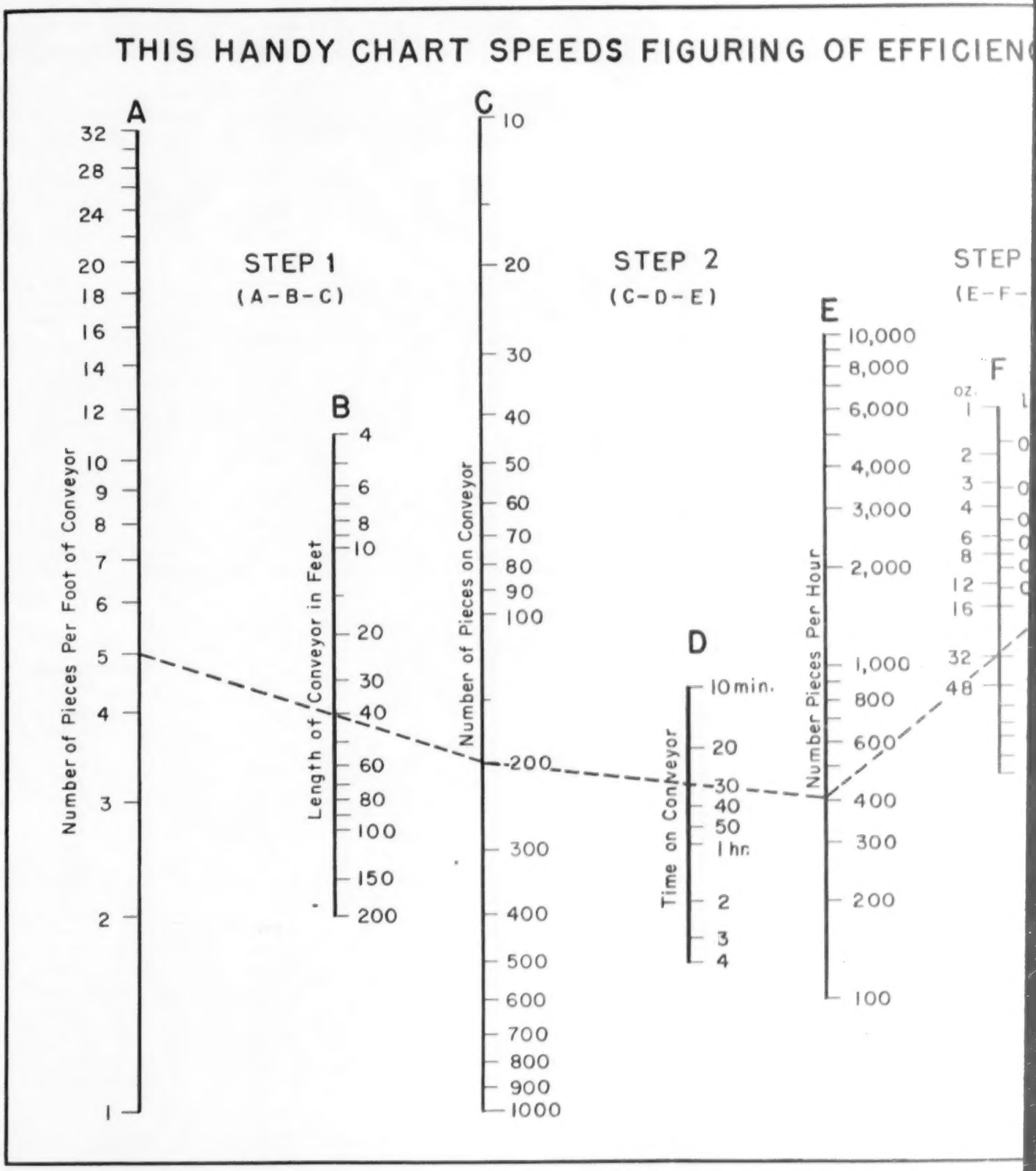
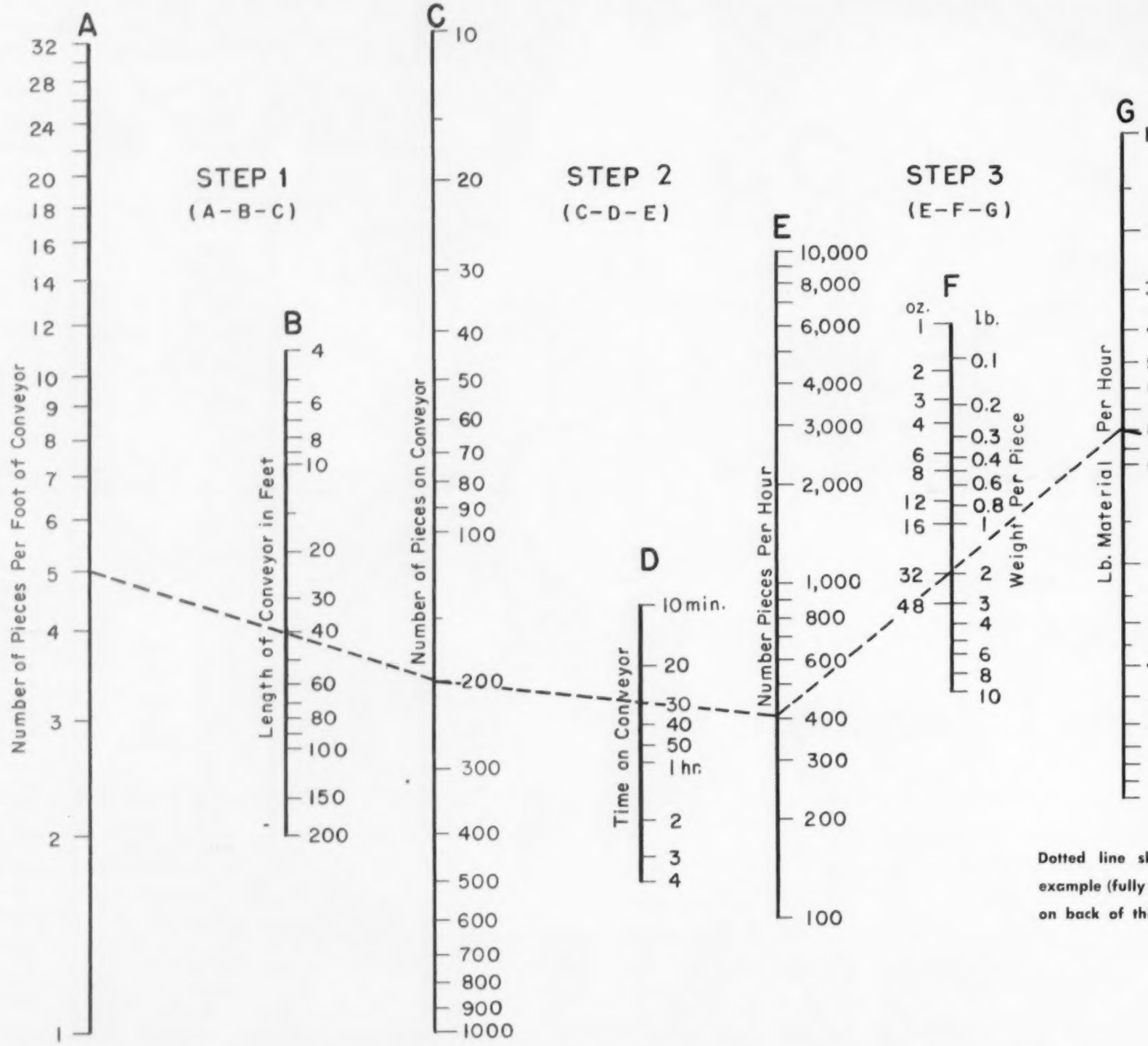


THIS HANDY CHART SPEEDS FIGURING OF EFFICIENCY OR FUE



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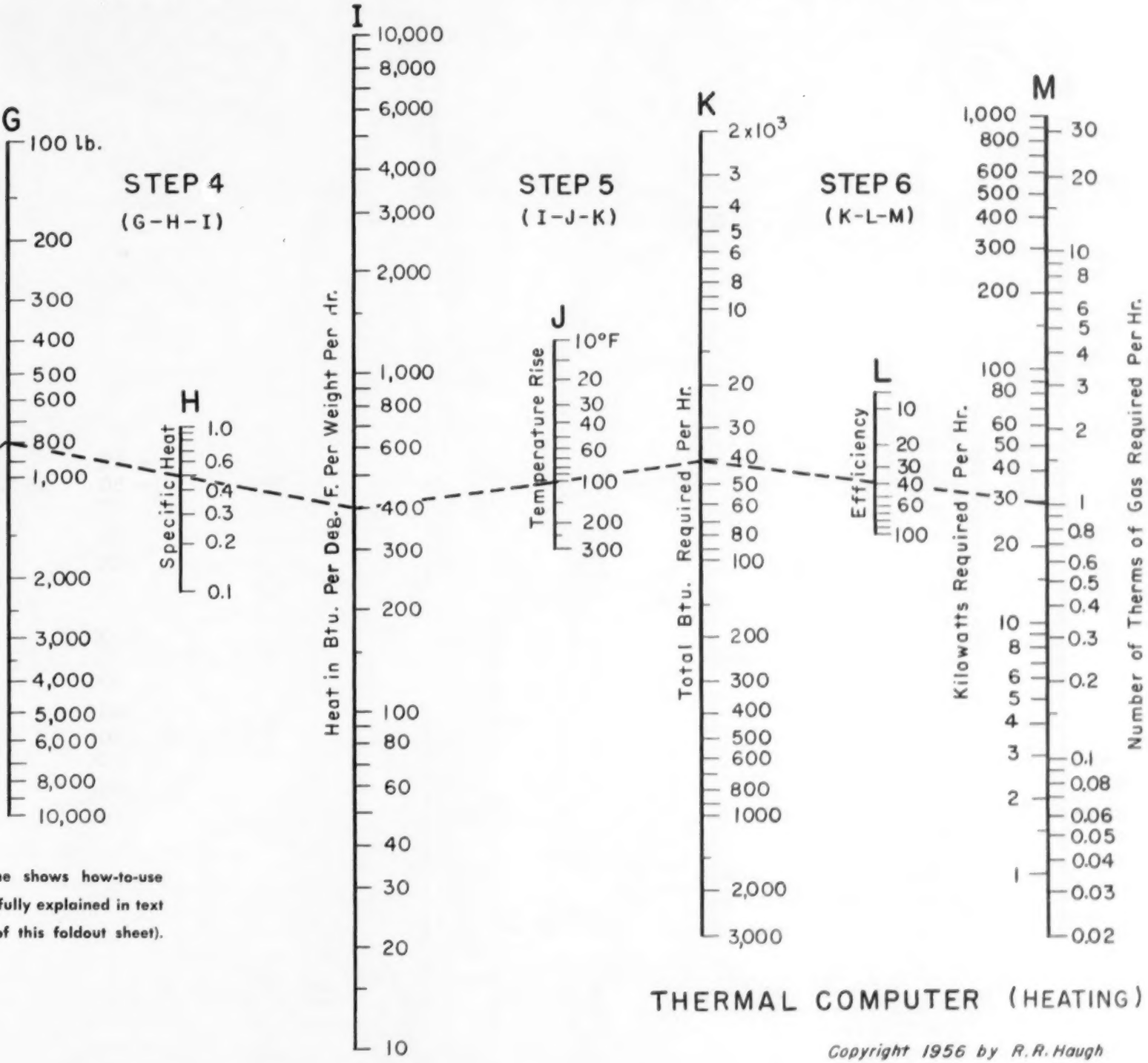
UEL REQUIREMENTS FOR YOUR HEAT-PROCESSING EQUIPMENT



e shows how-to-use
fully explained in text
f this foldout sheet).

THERMAL COMPUTER (HEATING)

Copyright 1956 by R. R. Haugh

Computer Design and Step-By-Step Directions

Operation of all 13 scales involves 6, overlapping steps—each consisting of two known variables and one unknown. It is specifically designed to analyze systems where only "sensible" heating—as differentiated from latent—is involved.

First three steps concern production calculations. As a rule, continuous heating methods for solids employ one or more conveyors that are synchronized with other processing units.

The load on these carriers (in pounds per hour) varies directly with their length, number of pieces per foot, and weight per unit piece. Load varies inversely with the length of time pieces are on the belt.

Last three steps in the nomograph involve computation of Btu's and amount of fuel needed to raise the product a given number of degrees.

Heat for processing any amount of product-pounds per hour is influenced by specific heat of the food and the amount of temperature rise. And kilowatt hours of electricity or therms* of gas per hour needed to heat this weight depends, inversely, on efficiency of the equipment.

For continuous liquid systems, batch loads of liquid or solid materials, and belt setups carrying loose powder or granular material, the first three steps in the nomograph are bypassed. Calculations start with flow of liquid or dry material in pounds per hour.

To illustrate overall usefulness of our chart, let's take an example of a belt heat-processing system:

Step 1: Connect the number of pieces being processed per foot of conveyor (Scale A) with length of the conveyor in feet (Scale B) by laying a straight-edge across scales (as indicated by dotted line on nomograph). Total number of pieces on the belt is found at the intersection of the straight-edge with Scale C (in this example, 200).

Step 2: Then connect Scale C with Scale D—time product is on the conveyor (in this case 30 min.) This discloses the number of pieces processed per hour (400 on Scale E).

Step 3: A straight line from Scale E through Scale F (weight per piece, 2 lb.) gives the pounds of product processed per hour on Scale G (800 lb.).

Step 4: Connect this latter point by a line through Scale H (specific heat, found for many common products in Table I). Btu's needed to raise an hour's production 1 deg. F. is revealed by the point of intersection with Scale I (400).

Step 5: A line from Scale I through Scale J (temperature rise, found by subtracting initial product temperature from final temperature) will show number of Btu's per hour necessary to heat the 800 lb. of food (Scale K).

Step 6: Final stage can be used in either of two ways: If efficiency of unit is definitely known, a line from Scale K through Scale L will disclose the amount of gas or electricity needed for hourly production (Scale M).

If, however, efficiency of the unit is the desired factor—then the amount of fuel consumed per hour must be known.

In the case of direct-fired gas units (such as fryers) or electrically-heated equipment, this is easily obtained by metering input with commercially-available instruments.

Most plant equipment, however, is steam heated. Moreover, the boiler generally supplies many pieces of equipment besides the one under test. So further calculations are necessary to gain exact information on fuel.

To do this, first measure steam flow into unit with a meter.

Next, obtain the effective Btu's per pound of steam from a standard steam table. For example, saturated steam at 100 psi. contains 1188.2 Btu's per lb. But on trapped equipment, available heat for the process is only the heat of evaporation. In our example, this amounts to 889.7 Btu's (the remainder leaves machine with hot condensate).

Dividing this figure by the efficiency of your boiler, you obtain number of Btu's that must be supplied by the fuel. And dividing this latter figure by 100,000 will convert it to therms, which can be plotted on Scale M.

Then a line from Scale M to Scale K will show efficiency of the machine (on Scale L).

If you fire your boiler or equipment with coal or fuel oil, convert the Btu's per lb. in these fuels into gas therms with handy Table II.

A limited number of reprints of this special chart are available at a price of 50¢ each.

Further, a food thermal computer for cooling will be published in a forthcoming issue of FE—The Editors.

TABLE I—CHECK HERE for Specific Heat of Foods (Used in Chart's Scale H).

Food	Specific Heat (Btu./lb./deg. F.)	Food	Specific Heat (Btu./lb./deg. F.)
Whole milk	0.92	Fresh mushrooms	0.94
Skim milk	0.95	Fresh peas	0.85
Butter	0.49	Potatoes	0.84
Fresh fish	0.86	Spinach	0.90
Fresh berries	0.89	Onions	0.91
Fresh fruits	0.80	White bread	0.65
Dried fruits	0.50	Flour	0.43
Bacon	0.48	Grains	0.45
Fat beef	0.69	Salt	0.27
Lean beef	0.82	Raisins	0.47
Fat pork	0.62	Rice	0.42
Lean pork	0.73	Egg white	0.92
Bones	0.40 to 0.60	Egg yolk	0.69
Fresh carrots	0.86		

TABLE II—HANDY CONVERSION FIGURES for Various Fuels (Maximum Heat Units).

Electricity	3,413 Btu. per kwhr.
Coal	12,000 Btu. per lb.
Gas	100,000 Btu. per therm
Fuel oil	18,500 Btu. per lb.

* The therm equals 100,000 Btu.'s and is used in many areas as a basis for commercial gas charges. Number of therms employed can be found by multiplying cubic feet of gas by its calorific value—*The Editors.*

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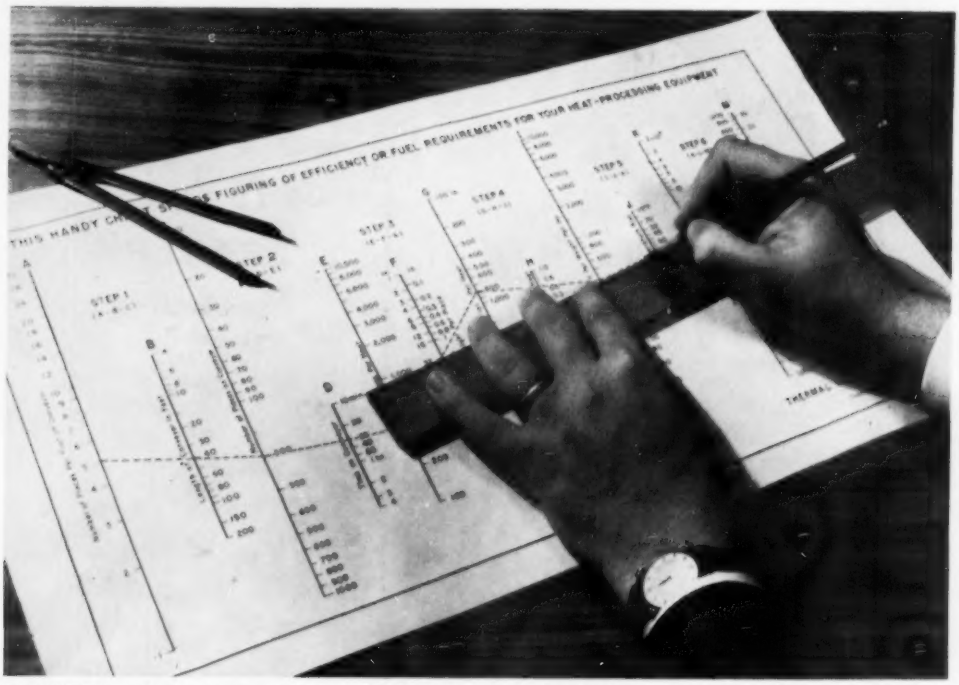


SOLUTION of heat-exchange problem in food engineering is simply found using only a ruler and this computing aid (reproduced in full working scale on inside of this foldout section).

This Foldout Chart Short-Cuts Heat-Process Calculations

Multi-scale nomograph—a new 'right arm' for food engineers—permits quick figuring of efficiency and fuel requirements for any type of liquid or solid heat exchanger

RAYMOND R. HAUGH

Chief Applications Engineer, Quartermaster Food & Container Institute, Chicago

HERE'S A BRAND-NEW TOOL—complete in these pages—for making fast calculations of thermal efficiency in heat-processing equipment.

Our computer, set up in this foldout, comprises a series of 13 logarithmic scales—arranged in the form of a nomograph. It is devised to solve numerous engineering design problems involving continuous and batch dryers, heat exchangers, pasteurizers, and other food-processing systems for liquids and dries.

Particular advantage of this handy figuring chart is the flexibility it affords the engineer, who can change any variable on the nomograph and immediately foresee its effect on the other factors.

Also, individual parts of the system can be used to check one or more steps in a process, such as determination of heat and fuel requirements, or quick calculation of loads on a conveyor belt.

←Unfold at left for chart and further details

POWELL NI-RESIST VALVES

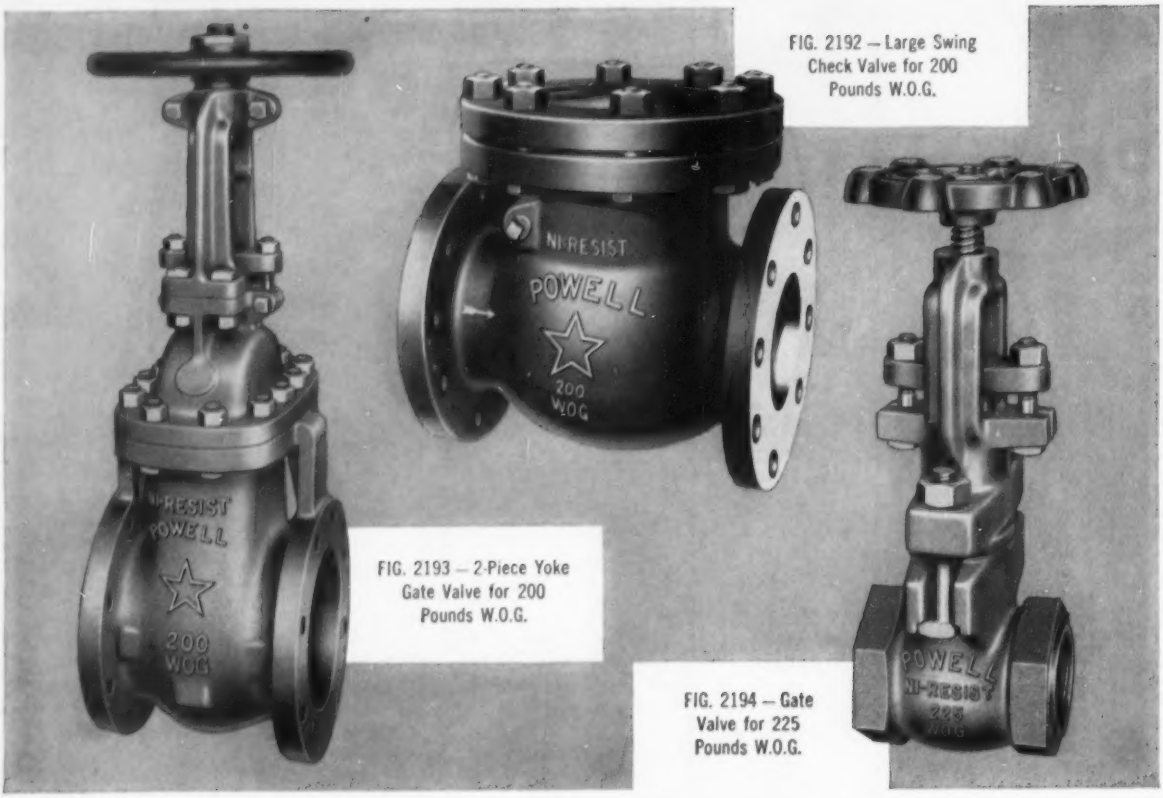


FIG. 2192 – Large Swing Check Valve for 200 Pounds W.O.G.

FIG. 2193 – 2-Piece Yoke Gate Valve for 200 Pounds W.O.G.

FIG. 2194 – Gate Valve for 225 Pounds W.O.G.

Resist corrosion, erosion, heat and wear

Powell Ni-Resist* Valves have far greater corrosion, erosion, heat and wear resistance than ordinary cast iron. Although comparable in strength and physical characteristics to gray iron, and resembling austenitic stainless steel, no other cast metal offers such a unique combination of useful properties.

While similar metals are now available, The Wm. Powell Company has selected Ni-Resist, the alloy cast iron developed by The International Nickel Company. Performance records, taken over a period of many years, conclusively prove that Ni-Resist has been used for valves, pumps and other equipment handling corrosive and erosive liquids with outstanding results.

Powell Ni-Resist Valves are especially adapted for handling soda and sulphate pulp and paper mill liquors, alkalies and sludges, and wherever high nickel-iron alloy valves are needed.

Consult your Powell Valve distributor. If none is near you, we'll be pleased to tell you about our Ni-Resist Valves as well as our *complete line* of *Powell Quality Valves* – all with *Performance Verified.*

PERFORMANCE PV VERIFIED

BRONZE, IRON, STEEL AND CORROSION-RESISTANT VALVES

* *Trademark of The International Nickel Co.*

The Wm. Powell Company, Cincinnati 22, Ohio . . . 110th YEAR

← For more data, circle this page number on card at back

ATTRACTIVE, practical research and control lab accents scientific environment, provides most modern equipment.

Lab for Product Improvement Has Latest Technical Tools

Functionally good-looking in and out, it is well arranged for efficient research and control, and equipped with most advanced instruments and apparatus. Test malting and brewing operations are instrument controlled

FE STAFF

RAHR MALTING CO. WANTED to get its laboratory staff out of a routine rut—give it a new look at plant problems in malting and brewing, expose it to new horizons.

And its aim for technical progress was pointed at a practical target—improvement in its customers' products.

So the Manitowoc, Wis., company has gone all-out in the purchase of latest instruments and apparatus for easier and more precise research and control work. Some of these tools will permit the scientists to penetrate barriers that have long been blocking some challenging, fertile fields of research.

Experimental units, too, are instrument-controlled. Employed are electrically timed cams, switches, and recorders.

Basically, Rahr—

1. Tossed out its cramped, outmoded laboratory and replaced it with a striking and imaginative two-level facility. Attractive both within and without, it accents practical operations and has plenty of room for expansion.

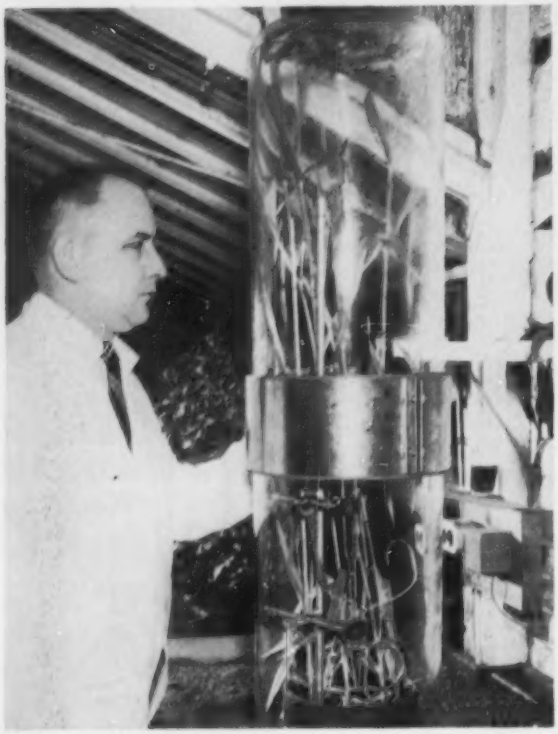
2. Laid out and staffed the new lab for most efficient handling of research problems and control work.

3. Equipped it with the most advanced analytical tools—such as radioactive-tracer units, chromatography devices, micro-Kjeldahl apparatus, and a number of others. Some of the instruments feature automatic controls.

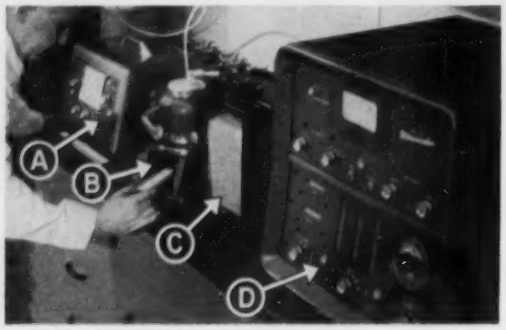
Organizational Setup

There follows a breakdown covering personnel activities, and utilization of floor space in the main laboratory

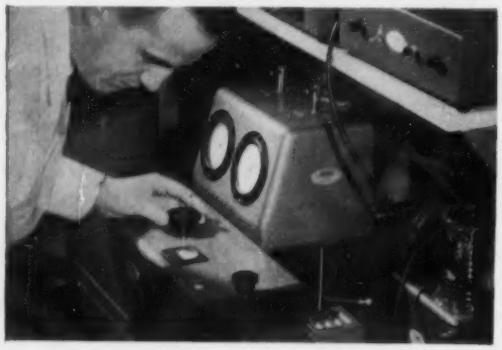
Research Lab With the Latest Tools



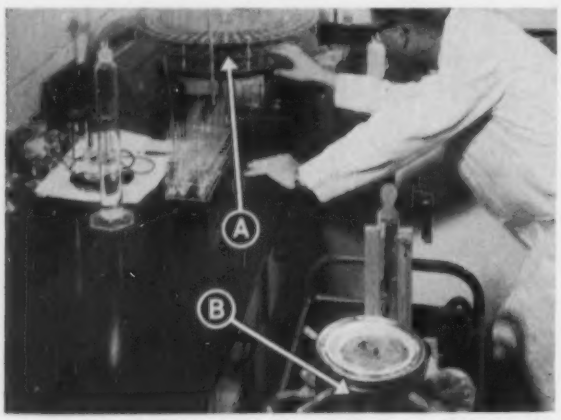
BARLEY is uniformly "tagged" with radioactive $C^{14}O_2$.



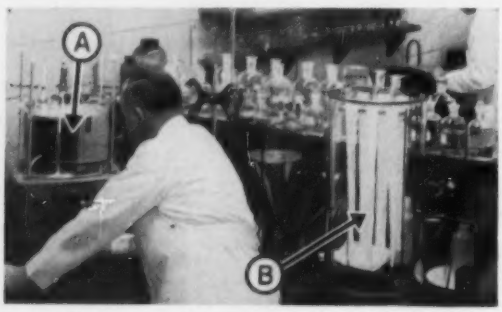
IN RADIOACTIVE-TRACER lab, specific characteristics are followed from seed to products. Employed are rate meter (A), Geiger tube with automatic feed (B), radioactive recorder (C), and scaler (D).



SPECTROPHOTOMETER (above) has flame attachment. Instrument is used for determining certain fractions in barley grain, malt, wort, or beer.



OTHER RESEARCH tools include fraction cutter (A), which is used for chromatography work. Also, freeze-drying apparatus (B), employed for low-temperature concentration of solutions containing unstable material.



RESEARCH on various enzyme reactions is carried out with constant temperature bath (A). Portion of equipment (B) is for paper chromatography.

divisions—research and control, which take in pilot malting and experimental brewing.

But first the office space: Located in a 1,452-sq. ft. area are three offices for key staff members—research director, chief chemist, technical director, and project engineer. Latter two occupy a combination office-library. And there's a separate room for three secretaries.

Research director heads all research activities, and technical director is in charge of coordinating all control activities. Assisting the technical director are chief chemist and project engineer.

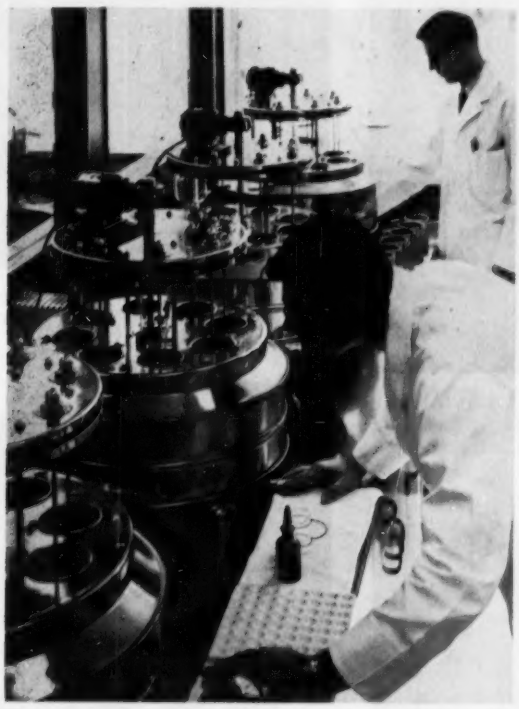
Research lab is split into two sections—basic research and experimental brewing.

Basic research occupies 530 sq. ft. of space, with 112 sq. ft. set aside for an office. Staff consists of senior

Control Lab Is Well Equipped and Planned

SAMPLES are ground in this mill room, which is kept under slight vacuum to prevent dust contamination.

PHYSICAL tests are rapid moisture determination (A), growth (B), and mellowness (C).



IN THIS SECTION, ground malt is mashed in electrically heated units prior to analysis of wort.

THIS PORTION of lab is devoted to filtration and chemical analysis of wort (extract, amylase, diastatic power).

biochemist, senior research analytical chemist, and two junior chemists.

The experimental brewery takes in 950 sq. ft. of basement space, which includes a separate 190-sq. ft. analytical section to check beer during different stages of brewing. In addition, there's a 250 sq.-ft. cold room that is separated for fermenting and storing beer. Senior research chemist, here, has three technicians.

Control lab also includes the pilot-malting sections. Complement is 16 persons, with 2 working in the pilot-malting lab.

First-floor space devoted to the control lab comprises 1,196 sq. ft. for major analytical work, 330 sq. ft. for barley sampling room, 100 sq. ft. for mill room, 100 sq. ft. for bacteriological section, and 800 sq. ft. for special control and research problems. Pilot malting

is carried out in 494 sq. ft. in the laboratory's basement space.

Remaining basement area occupied: 140 sq. ft. for taste-panel testing, 528 sq. ft. for utilities, 760 sq. ft. for equipment and sample storage, and 250 sq. ft. for receiving and shipping.

Here's a sequence run-through on work going on and interesting equipment and instruments in different lab sections—

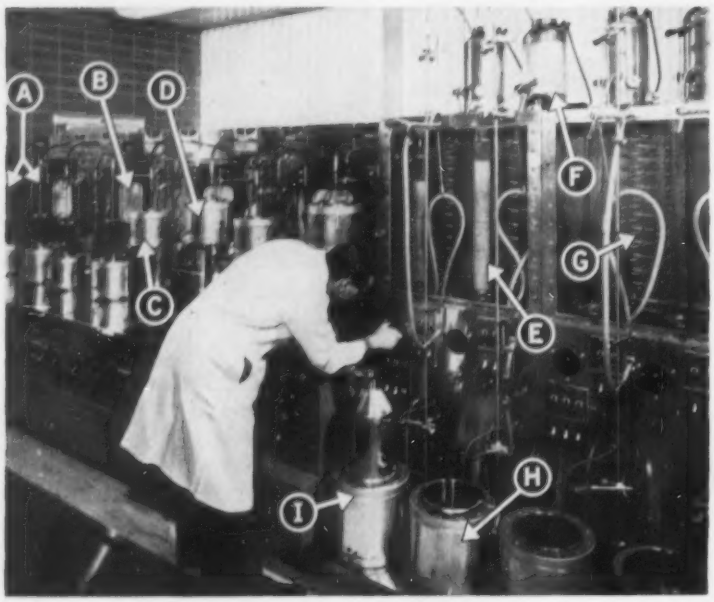
Basic Research:—Rahr is focusing its research sights on countless problems pertaining to barley, malt, and beers. It will pinpoint critical investigations for specific malting and brewing needs.

Tracer Lab

Unique is the challenging biochemical research work in the radioactive tracer lab. Here, a biochemist is employing atomic-age techniques to trace specific char-

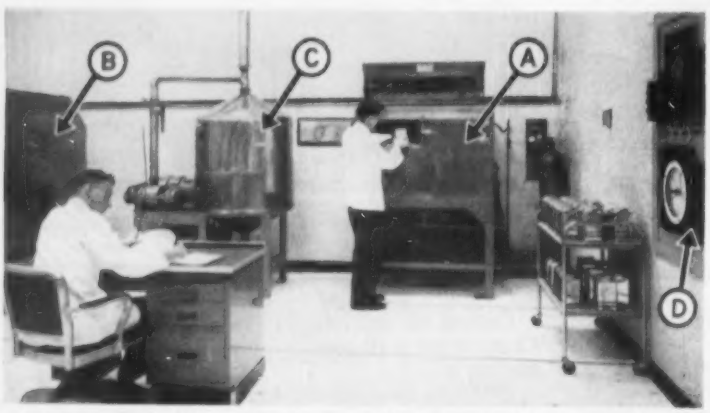
(*Turn to page* 194)

Malting, Brewing, Taste Testing



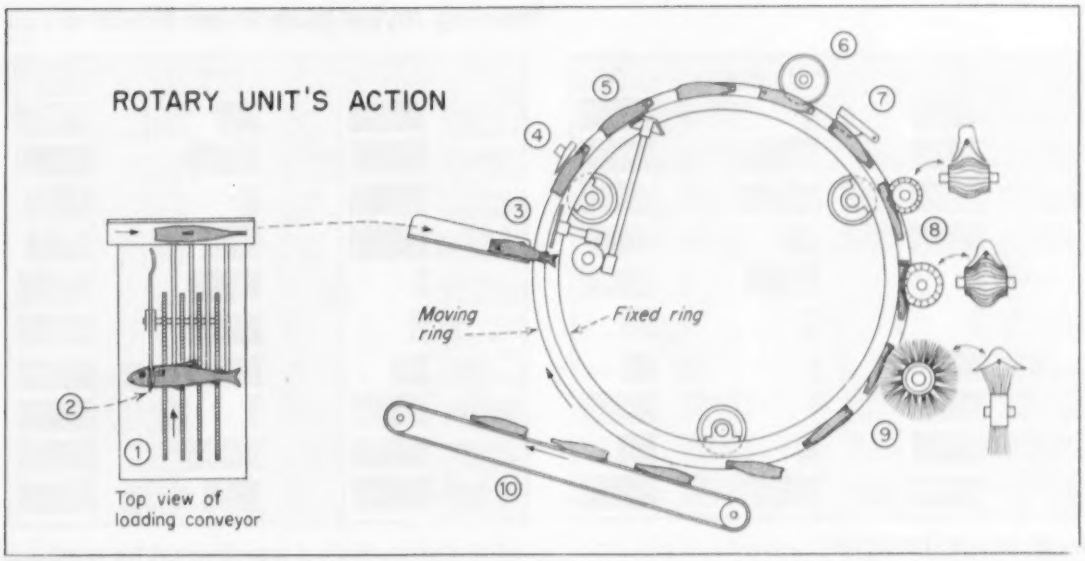
EXPERIMENTAL BREWERY is equipped with variable-speed mixers (A), temperature recorders (B), cereal cooker (C), mash tub (D), lautering column (E), sparge tanks (F), cooling coils (G), wort collector (H), and brew kettle (I).

TEST BREWS are analyzed with alcohol-distillation units (A), micro-Kjeldahl equipment (B), colorimeter (C).



IN EXPERIMENTAL malting plant, small barley samples are steeped (A), germinated (B), kilned (C). Note panel (D) with controlling and recording instruments for conducting operations under precise conditions.

WELL-TRAINED taste panel finishes off evaluations of brews by checking for aroma and flavor.



DRESSING-CYCLE SCHEMATIC: (1) Fish enters on roller conveyor, (2) head cut off, (3) fish pinned, tail removed, (4) bottom fins off, (5) side and top fins off, (6) belly slit, (7) fish flattened, (8) viscera removed, (9) body cavity brushed, (10) dressed fish discharged.

Large-Fish Dressing Automated By New Russian Machine

- **Unit eliminates manual cutting, cleaning**
- **Boosts output to 5-10 tons per hr.**
- **Stresses easy sanitation**

DAVID N. LEWIN
Lewin Associates, Food Consultants, New York City

HIGH-SPEED, MACHINE-TYPE processing of large fish is the latest addition to the growing list of Russian food-engineering advances (also see FE Oct. '55, p. 66).

It's being done with a new rotary unit that successively removes the fish's head, tail, and fins, then eviscerates the body cavity and cleans it.

Further, sanitation is emphasized though continuous-conveyor waste disposal and 30-psi. water-spray flushing of eviscerating mechanisms.

Operated by one man, the machine is now handling 5-lb. (average) salmon-type fish at 40-60 per min. Since they usually are prepared for smoking, this equipment is not designed to remove skin, scales, or backbone.

Unit has six principal operating components: Feed and discharge conveyors, a hollow rotor, fish-holding pins, circular knives and saws, scrapers, and brushes.

The 4-ft.-dia. rotor consists of parallel disks with inner edges beveled to form a pulley-like rim groove in which fish are processed. These disks are set slightly apart, thus providing a space through which waste is discharged. The assembly is gear-driven at 8-12 rpm. and supported by three roller bearings.

There are five sets of pins in each rotor half. These projects into the groove to hold the fish and carry them through processing points. The pins then recede to release the dressed fish. Cutting and cleaning devices are spaced around the rotor periphery, and five fish are processed per revolution.

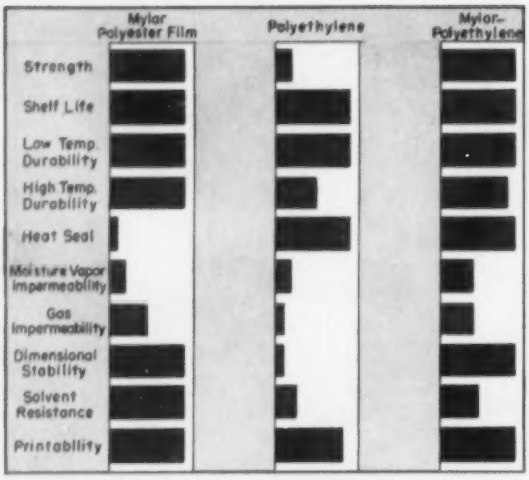
Processing Cycle

As shown in the accompanying schematic, fish are placed at specified intervals on a short feed conveyor and pass beneath a curved knife that lops off the heads. This knife is synchronized with the conveyor and set to cut parallel with and close to the gill line.

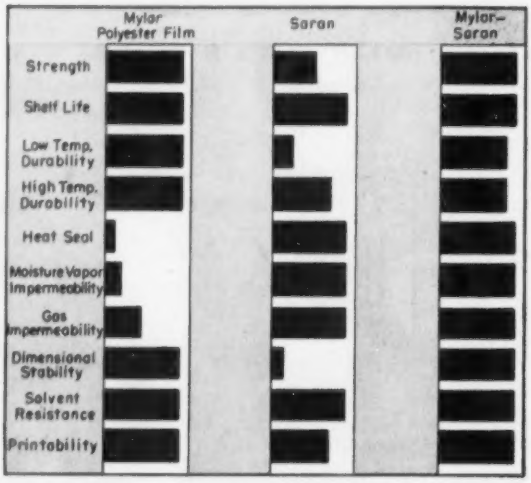
Beheaded fish then drop into a chute and slide on their backs, tails first, toward the rotor groove. Here, the pins clamp them and a circular

(Turn to page 218)

Teaming Mylar With Other Flexibles . . .



1—MYLAR-POLYETHYLENE combination is stronger and more impermeable than polyethylene, more heat-sealable than Mylar.



2—SARAN-MYLAR film is more durable at low temperature than Saran, and more stable. It is better than Mylar in sealability and impermeability.

How Flexible-Film Combinations Solve Package Problems

By laminating Mylar with other films, shortcomings of each overcome. Bar charts show properties of combinations at glance. Some surprising. Mylar also could be used to contain propellant gas in aerosol cans.

WILLIAM H. WOOD

Sales Development & Technical Service, Film Dept., E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

IT IS POSSIBLE to combine individual films to eliminate the deficiencies of each, and to capitalize upon the desirable characteristics of each. This is the fundamental basis for the development of laminated or coated film structures.

Du Pont's Mylar polyester film is of particular interest as a component for multi-layer structures, because its combination of physical properties is somewhat unique among flexible packaging films.

The desirable properties that can be attained by laminations are presented here, in easy-to-visualize bar charts.

But first, the properties of Mylar.

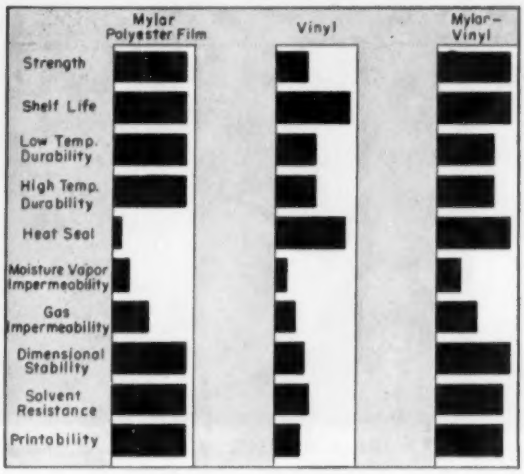
The film is inherently strong and tough—as evidenced by tensile, impact, and bursting strength, and flex life (see table). Tear strength, however, is relatively low in comparison to that of many other flexible films. This value, of course, refers to the force required to propagate a tear once started. By contrast, the initial tear strength is very high, serving in part, at least, to compensate for the low propagation value.

The film is quite permanent in respect to dimensional

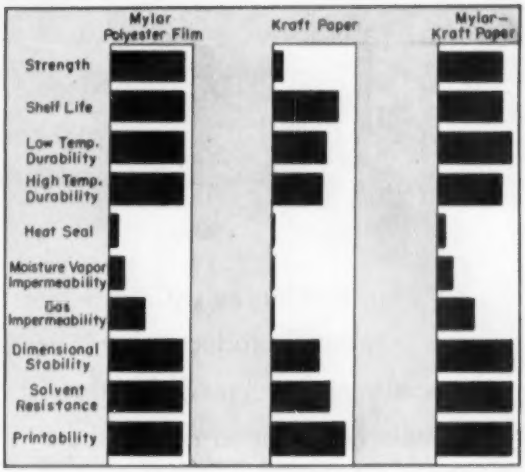
Physical Properties of Mylar Polyester Film

Tensile strength	17,000-25,000 lb./sq.in.
Impact strength	70 kg. cm./mil
Tear strength	18g./mil
Bursting strength	45 lb. sq.in./mil
Flex life (0 deg. F.)	20,000 cycles
Elongation (break)	70-130%
Shrinkage	1-2% at 150 deg. C.
Water-vapor permeability	0.90g./100 m²/hr./mil
Oxygen permeability	0.90g./100 m²/hr./mil
Solvent and oil resistance	Excellent

Gives High-Score Packaging Materials



3—VINYL-MYLAR combination is better in many ways than vinyl alone. It heat-seals much more readily than Mylar, and is more impermeable.



4—WITH KRAFT paper, Mylar produces a strong, flexible material with good stability and high solvent and grease resistance properties.

changes. It has relatively low elongation, and it shrinks less than 2% at temperatures up to 150 deg. C. It remains flexible and strong over the extreme temperature range of −80 to +300F.

It is only moderately permeable to moisture vapor and gases, but shows excellent resistance to oils, greases, and common chemicals—with the exception of strong alkalis. The latter reagents hydrolyze esters, including polyesters.

The development of techniques for solvent-sealing Mylar with benzyl alcohol permits it to be used on automatic packaging machines.

In Combination With Other Films

Relative characteristics of films and combinations are shown in the accompanying bar charts.

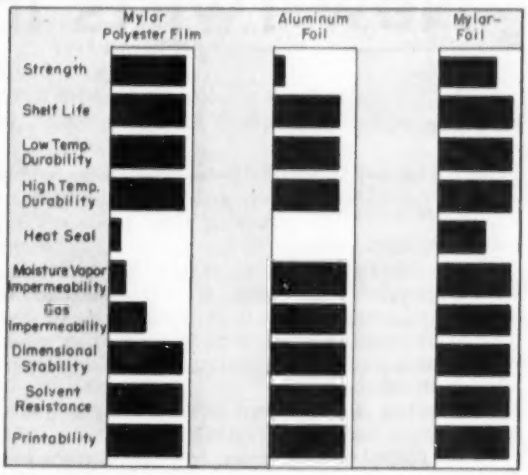
When we superimpose the graph for polyethylene on the graph for Mylar polyester film, we get the results shown by Fig. 1.

The polyethylene has been strengthened, and tensile is essentially that of the particular gage of Mylar employed. The film is useful at a somewhat higher temperature than is polyethylene alone. Dimensional stability of polyethylene is enhanced. Mylar acquires the key property of heat sealability. And the increased thickness of the combination imposes a greater barrier to gas molecules, including water vapor.

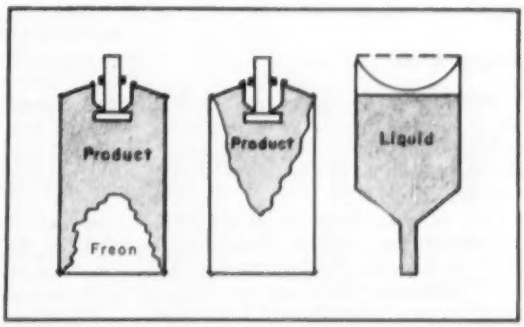
Many such combinations are available on the market today—both as laminations and as extrusion coatings of polyethylene on Mylar. The final properties, of course, are dependent to a large extent upon the thickness of each component and the adhesion between the separate layers.

Some new developments in adhesion have resulted in Mylar-polyethylene combinations having heat-seal peel strength greater than the tensile strength of the combinations. Tests conducted in our laboratory on a com-

(*Turn to page 150*)



5—ALUMINUM FOIL and Mylar have excellent properties in combination. Surprisingly, this material will heat-seal readily. It is strong and quite impermeable.



AEROSOL CANS (left) in which Mylar pouch separates Freon from the product. Perforated bottom can with flexible Mylar disk (right) permits measured pouring of liquid.

HERE ARE A NUMBER of popular food products that

As a low-cost ingredient, lactose is now upgrading products, improving processing techniques, tightening formula control, and playing notable part in creating new items

New Twists in Lactose Uses

FE STAFF

FOOD MANUFACTURERS are now giving edible lactose a careful examination—and discovering in it an important "tool" for improving their products, and cutting ingredient costs.

They're turning to it where a sugar of low sweetening power is sought. And because it's not fermented by baker's yeast, they're using it to replace some of the fermentable sugars and cash in on its tenderizing, moisture-retaining, and color-appealing caramelizing properties in baked goods.

True, lactose is well known to the makers of infant baby formulas and pharmaceuticals.

To the general food processor, however, it might just as well be considered a new ingredient. That's because its many properties have, until only recently, been overlooked and not intensely studied. Processors have simply taken for granted its common benefits whenever using whole milk, non-fat milk solids, or dry whey.

What It Does

Now food technologists are re-evaluating this ingredient to discover new ways of improving products, controlling formulations, aiding processing techniques, simplifying handling of certain products, and producing new items.

Let's consider these one at a time:

1. Improving products: This is accomplished by the many quality-promoting properties of lactose, such as:

. . . **enhancing flavor** and extending MSG or protein hydrolysates with addition of 1-3% lactose to Roquefort cheese, Thousand Island dressing, barbecue sauce mixes, and canned vegetables.

. . . **retaining and highlighting** color in berry preserves, by replacing 14 to 15% of sucrose with lactose.

. . . **adding to tenderness,** flakiness, and appetite-appealing color, by introducing about 4% lactose (based on amount of flour) into pastry dough going into manufacture of frozen pie crust. Moreover, a 25% lactose solution makes an excellent frozen pie-crust glaze or wash.

. . . **serving as carrier** for ascorbic acid-citric acid preparations in canning fruit preserves. Here, lactose extends activity of ascorbic acid, and it helps retain natural fruit and berry pigment. It's also employed as a carrier for MSG.

. . . **tenderizing** and improving caramelization of yeast-containing baked goods, by addition of 2-3% lactose. No matter how long a dough is kept, lactose is retained to impart uniform baked color and promote moisture retention.. Upon baking, some of the lactose forms a syrup that has a greater affinity for moisture than other water-absorbing agents like high-protein-containing flour and milk. Sliced lactose-containing bread, too, tends to hold moisture longer and even picks up some.

. . . **bettering whipping properties** and extending shelf-life of powdered whole eggs.

. . . **sharpening taste** of fruit-flavored soft drinks.

. . . **capturing flavor** of soluble coffee, by adding a small percentage of lactose to the concentrate prior to drying.

. . . **improving color** of potato chips by rinsing slices in ½% lactose solution prior to frying. Addition of 2-3% edible lactose to Corn Kurls, and similar party snacks, does the same thing.

. . . **assuring uniform** color for top appeal in bread mixes. by adding 3% lactose and then using products to manufacture breading for fried fish, seafoods, poultry, meats, etc.

may be greatly improved by inclusion of the new edible lactose. It's noted that they represent nearly all the food branches.

. . . **preventing browning** of catsup in neck of bottles, by incorporating a small amount of lactose.

. . . **duplicating mother's milk,** by incorporating 72% lactose in infant food formulas to get the same lactose-to-milk ratio of protein.

. . . **reducing butterfat content** of chocolate drink. By adding lactose, you can produce low-butterfat chocolate drinks that taste as rich, while carrying a more pronounced chocolate flavor, as drinks containing twice as much fat. Savings in cost are thus very substantial (see accompanying Table II).

Lactose is added directly to the mix, which is then pasteurized according to recommendations of the chocolate base manufacturer.

2. Controlling formulations: Pure edible lactose can now help food technologists set up formulas to more precisely control the quality and shelf-life of foods.

They can put it to work in regulating sweetness, retaining aromas, enhancing flavors, highlighting colors, controlling crystallization of sugars, and making dessert powders free-flowing.

3. Assisting processing: Researcher's and food processors are finding lactose an aid to production. For instance, tomato juice can be spray-dried by conventional methods. Fruit juice flavors are better retained, and more are absorbed upon spray drying.

Lactose is being used to seed sweetened condensed milk and high-solids ice cream mixes to produce optimum sugar crystallization.

4. Simplifying product handling: By incorporating lactose into vending machine items like instant coffee and powdered soups, they're made more free-flowing, thus easier to dispense.

5. Producing new items: Vending machine dispensed powdered coffee and soups, also powdered cream, are examples. Others are bound to come.

Other Applications Seen

In addition to those mentioned above, there are other potential uses for lactose in bettering quality, such as—

. . . **absorbing** flavor of vanilla, essential oils, and other extracts, more extensively and tenaciously.

. . . **preventing haze** and so maintaining clarity of beers and ales.

. . . **reducing sweetness** of cured meats, and preventing the softening of the meat's (Turn to page 148)

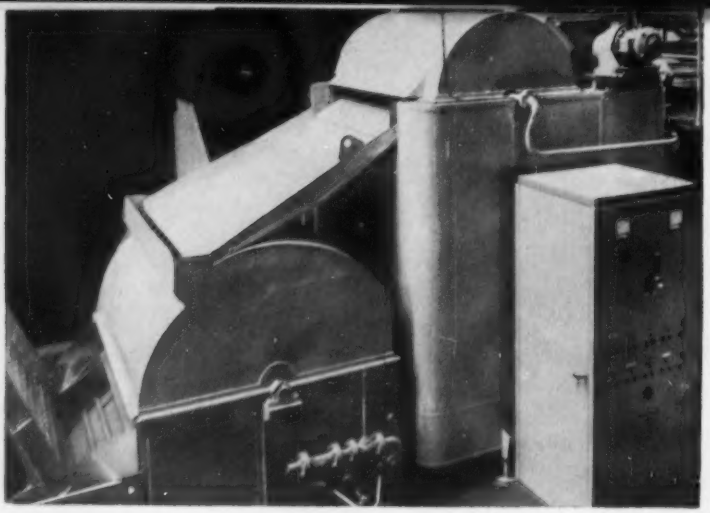
TABLE I—SPECIFICATIONS of Edible Lactose

Moisture	Not more than 0.75%
Acidity, as lactic	Not more than 0.04%
Lactose (monohydrate)	Not less than 98.5%
Protein (N x 6.25)	Not more than 0.30%
Ash	Not more than 0.40%
Fat (ether extractable)	Not more than 0.25%
Heavy metals (as Pb)	Not more than 5 ppm.
Turbidity	Not more than 50 ppm.
Color	Not more than 50 ppm.
Dextrose or sucrose	None
Dextrin and starch	None
Flavor and odor	Not greater than No. 3
Scorched particles	Not more than 15 mg./50 g.
Extraneous matter	No evidence of filth or contamination
Bacterial estimate	
Standard plate count	Not more than 10,000/g.
E. coli	Negative in 10 mg.
Spore formers	Negative in 100 mg.

TABLE II—RECOMMENDED LACTOSE LEVEL and Savings Resulting From Its Use in Chocolate Drinks

Butterfat Content		Lactose Added	Savings
Original (percent)	Reduced (Percent)	(Percent)	Per Qt. (Cents*)
0.50	0.00	1.0	0.50
1.00	0.25	1.0	0.81
2.00	1.00	1.0	1.41

* Based on lactose at 20c./lb., butterfat 85c./lb.



FREEZE-THAW DRUMS prepare tomatoes for peeling. Product enters top drum, where chilled brine frosts skin, then drops into warm water tank (bottom). Here, enzymatic action dissolves pectins – thus loosens skins.

Novel Freeze-Enzyme Technique Peels Tomatoes at 6 Tons/Hr.

New Line Also Boosts Yield and Quality

DIEGO STRANIERO
McGraw-Hill World News, Rome

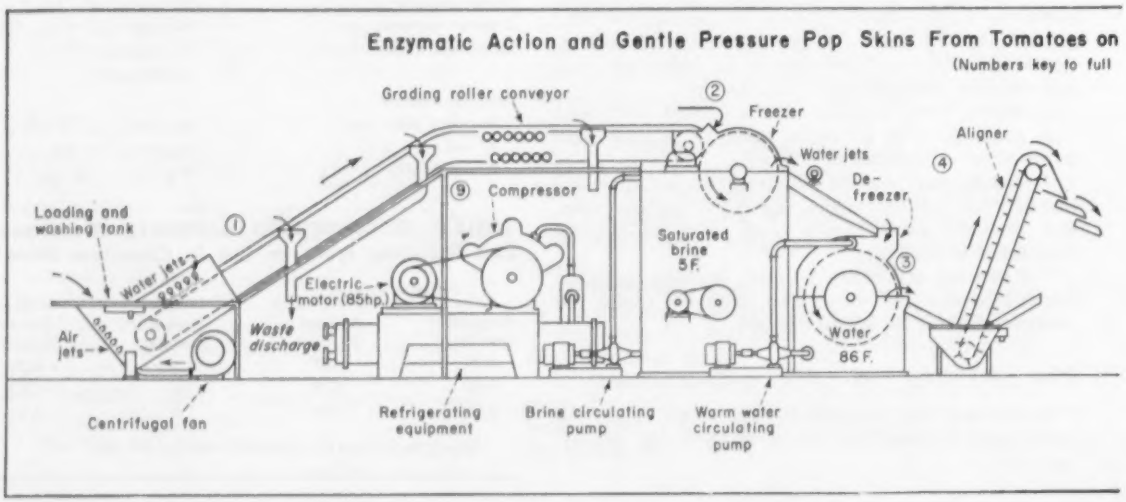
CANNERIES in Italy are now peeling tomatoes by plunging them briefly into a chilled salt solution–then allowing them to thaw so enzymes can break down sub-surface pectins. It's done with a novel system patented by Dr. Delfino Cagnoni of the Study Center for the Application of Cold, Padua.

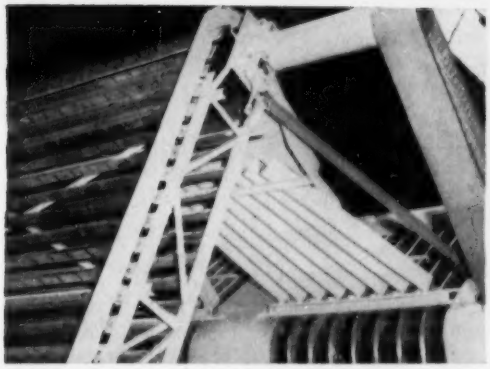
The technique, said to cut peeling labor a full 70% and boost yield and quality, is incorporated in a series of compact machines (Peeltomatic, Termomeccanica Co., La Spezia) recently put into action in three Italian canneries.

In the process, only the skin and a layer of flesh immediately under it are frozen. This takes 30-40 sec. in a concentrated, sodium chloride brine, held at 5F. During this brief period, ice crystals form and rupture flesh cells in the area.

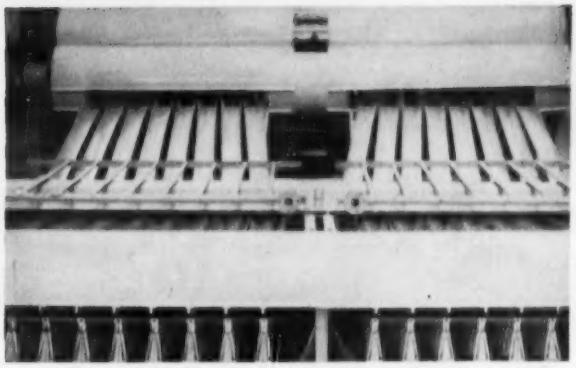
Then the tomatoes are abruptly submerged in warm water, thermo-regulated at 86F. Here, enzymes, released from the broken cells, do their work with amazing rapidity. In 8-10 min. they dissolve pectins that normally hold skin to the tomato–leaving the vegetable floating free in a skin "sack".

A special device removes the skin, and tomatoes are ready for canning. Flow rate is 5½ to 6½ tons per hr. And because only the yellowish skin is removed–in





ELEVATOR (left) aligns tomatoes for machine at right, where knives snip skins at tomato ends. Chutes (center) guide tomatoes into the 16-section cutter.



ENTERING PEELER by chutes (rear), tomatoes are carried in pockets between triangular blades. Friction and paddle, devices remove peel.

contrast to heat treatments where a thin layer of meat is peeled, too—tomato yield and appearance are boosted considerably.

Enzyme Action Proved

Results of many lab analyses have led Dr. Cagnoni to give the following explanation of the freeze-enzyme action:

The tomato enzymes (catalytic substances found in the vegetable cells) are very sensitive to temperature. Thus, while 104F. is their optimum thermic level, they are generally destroyed at 167-176F.

But low temperatures merely delay the action of these substances. They recover on returning to normal temperatures.

Applying these facts in the peeling process, it is discovered that the detachment of the skin does not take place immediately after thawing. Indeed, the length of time varies with temperature of the thaw water. If latter is at 50F., it takes about 30 min. to loosen peel. At 158F., however, one min. is sufficient.

Further, if thawing temperature of tomatoes is raised to 167-176F., tomato and skin present the same appearance as that of a heat-treated vegetable. And if tomato is frozen, then scalded at 212F. for 15 sec., and finally placed in 104F. water—appearance is also that of a heat-treated tomato.

Finally, if the sub-cutaneous cells of the tomato are broken by means other than freezing—such as shocks, pinching, pressure, or ultra-sonic vibrations—and it is then immersed in warm water, the peel detaches in the same way as in the case of tomatoes treated by cold process.

These facts prove that not only is the "ungumming" of the peel caused by enzymatic action, but that the cold treatment can be replaced by any other method that will rupture the sub-surface cells without impairing activity of the enzymes.

How Equipment Works

Production on the straight-through line starts with a wash tank, where tomatoes are thoroughly cleaned with water that is kept in agitation by compressed air—Point (1) on accompanying diagram.

A roller conveyor serves the dual function of inspection table and elevator for lifting tomatoes from washer to freezer.

Entering the latter unit—Point (2)—tomatoes fall into a rotating, pierced drum that carries them through the chilled brine at a fixed speed in about 40 sec.

Tomatoes then discharge into the thawing unit (3), where a larger drum carries the surface-frozen vegetables through 86F. water in 7-8 min.

Proper circulation of brine and warm water in their respective tanks is assured by two pumps. A geared motor drives the roller conveyor and the freezing and thawing drums.

Leaving the thawer, tomatoes enter a special elevator (4) that aligns them, then dumps them down 16 V-shaped chutes to a cutting device—Point (5).

Here, vegetables ride on spring-like rollers through two fixed knives that snip both ends of the tomato to facilitate removal of the peel.

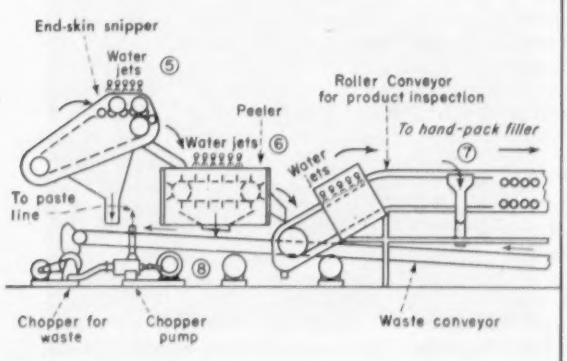
Thus snipped, tomatoes travel down another set of chutes to the actual peeler (6). This unit is divided into 16 channels by pairs of inclined planes. Each plane is covered with grooved rubber, resting on a foam rubber base. The planes are given a gentle fluttering movement by mechanical cams.

Between the planes are a series of little paddles, fitted on each side with grooved rollers that contact the

(Turn to page 141)

This Straight Through Line

description in text)



CONTROL TOWER masters conveyor system. From here orders are relayed to workers in all parts of warehouse via intercom, and final checks are made on outgoing shipments. Push-buttons (top) actuate power boosters in system.

Slow Flow in Multi-Floor Plant Licked by Conveyor System

Combination of power and gravity units cuts 5-floor warehouse's car-unloading time more than 90%. Further, delivery-truck loading is reduced from hours to mere minutes

CONTINUOUS MOVEMENT of foods into and out of storage speedily cuts warehousing costs and handling times "to the bone."

This is being pointedly demonstrated at Black Hills Mercantile Co.'s 5-story grocery warehouse in Deadwood, S. D., where a system of inter-floor conveyors has now replaced the old hand trucks and single elevator.

With action mastered by a "nerve-center" control tower, the new installation—

1. Doubles performance of present crew.

2. Reduces operating expenses 20%.

3. Cuts car unloading time 90% (from up to 5 days down to 1 hr.).

4. Speeds truck loading, which now takes but 35-40 min. compared with 2 hr. by the old system.

In addition, the owner estimates that the new system will pay for itself in only two or three years.

How It Works

The system, which was designed by the company's president, George R. Hunter, comprises: (1) Seven inclined inter-floor belt conveyors; (2) five short inclined belt conveyors, and (3) a total of 815 ft. of gravity wheel conveyors. All units were supplied by The Rapids-Standard Co.

Packages move over most of the system by gravity, with the aid of the short belt conveyors, which elevate them at strategic points. Movement between the five floors is by the inter-floor belt units.

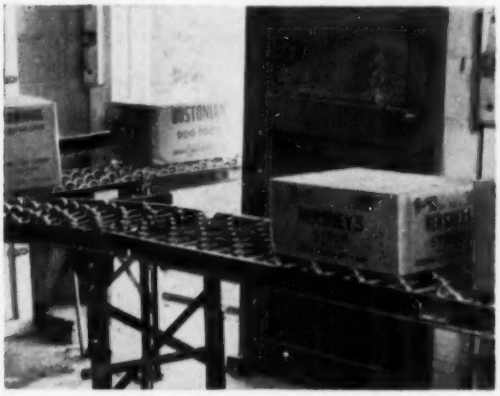
In operation of the system, incoming goods are unloaded onto gravity wheel conveyors extending into cars or trucks. From here they move to an inclined belt, which can be pivoted to direct the flow to the basement and to all other floors of the building.

Goods move directly to storage points on all floors without manual

(*Turn to page 218*)

PROXIMITY of goods to conveyor lines enables fast order selection. Line shown serves 3-room 2nd floor storage area.

INTER-FLOOR CONVEYOR (arrow) elevates items from basement and from 1st floor. Then they move by gravity to main line (right). Similar belts transfer products between the five warehouse floors.

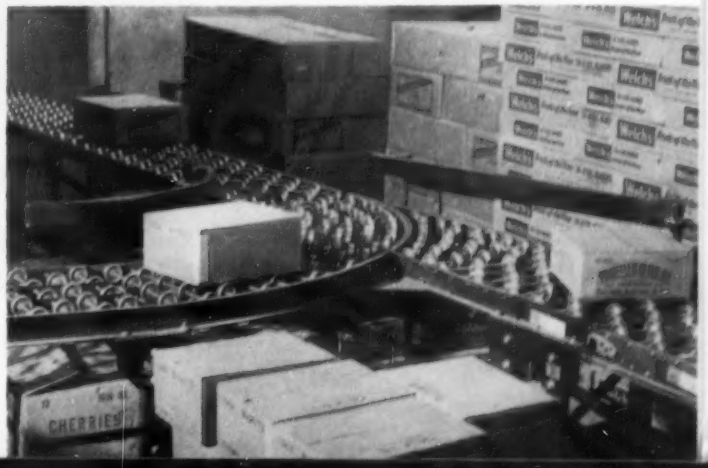


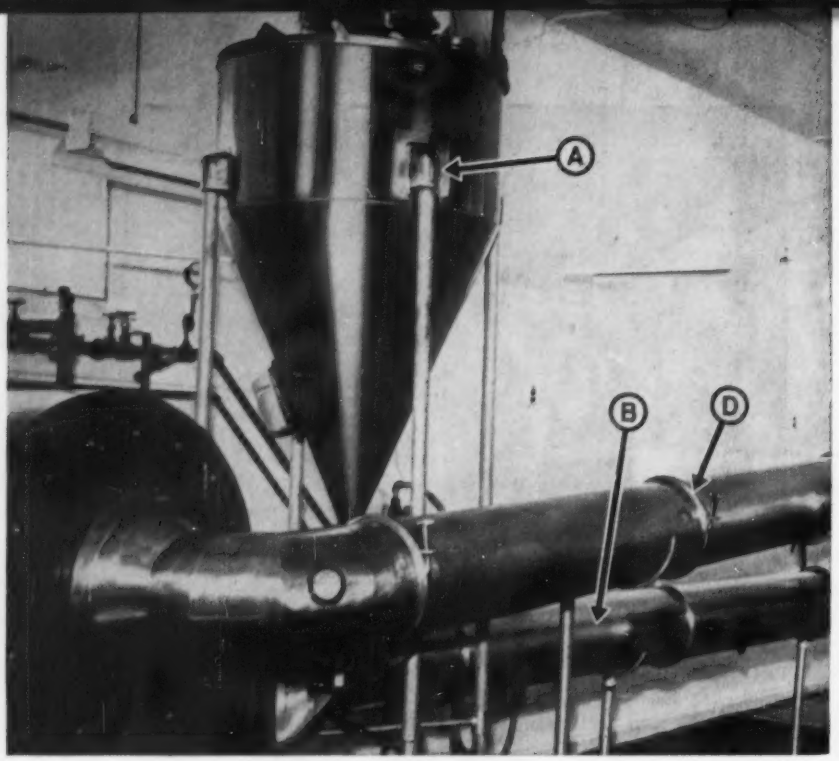
TWO roller conveyors handle all incoming merchandise, whether received by freight car or truck.

UPPER conveyor distributes incoming goods to 2nd floor (straight ahead) and to 3rd floor by spur. It also collects outgoing items, which are transferred to lower conveyor.

BOOSTERS are installed in lines to provide necessary height for gravity runs.

OUTGOING GOODS from upper and lower floors converge here and proceed (via door, upper left) to control tower and dock.





SOLIDS are hopper-fed (A) to agglomerating tube (B), where they are wetted by humid, high-velocity air, then delivered to collector (C). Moist air is recirculated through tube (D).

New Way to Instantize Milk Solids

Four-step process converts wetted particles into porous clumps that are continuously re-dried, cooled on vibrating table, and sized into uniform, easy-to-disperse clusters at a 2,000-lb./hr. rate.

ED CARLSON, R. A. WEIR and JOHN V. ZIEMBA

Respectively, Paint Manager, Dry Milk Products Co., Eau Claire, Wis.; Product Sales Supervisor, Cherry-Burrell Corp., Cedar Rapids, Iowa; and Associate Editor, "Food Engineering"

LET'S SAY you're putting milk through the conventional drying process. Question: What, now, is further to be gained by re-wetting and re-drying it?

A number of things, as a matter of fact—as Dry Milk Products Co., Eau Claire, Wis., has demonstrated, using its newly installed Cherry-Burrell A-R-C-S instant-solubility system.

But first, a few words on the four basic steps of the operation: Agglomerating, re-drying, shaker-cooling, and sizing. The technique works this way—

1. Powder is introduced into the agglomerating section so as to sufficiently wet it to clump particles, which are then carried to a collector by a high veloity stream of moist air.

2. Then the product is picked up by a fast-moving stream of heated air. And drying—to desired moisture content—takes place in a vertical tube that expands (diameter-wise) as it feeds into another collector.

3. Clumped powder discharges through a rotary air valve onto a vibrating table, below which cool air is continuously introduced.

4. Cooled powder is fed through adjustable sizing rolls that reduce it to uniform-size pellets, ready for packaging.

Powder's Properties Changed

Following several month's experience with the new system, the company came up with these findings:

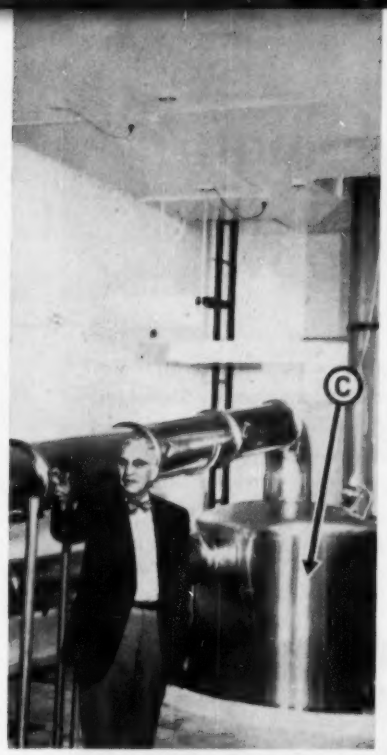
1. Solubility: Fine milk powder, transformed into clusters, instantly dissolves in hot or cold water. Reason is that lactose has remained readily soluble in water, and the re-dried clusters are porous.

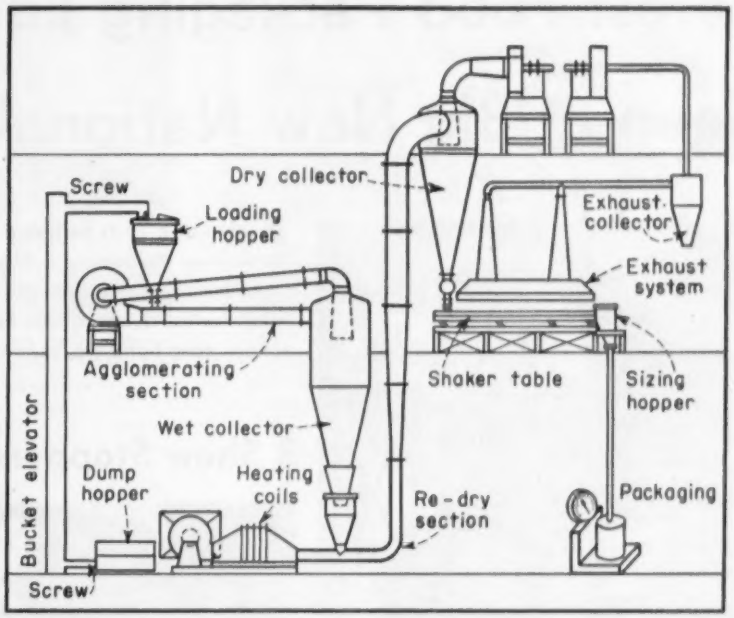
2. Flavor: Based on taste tests, milk solids have, in no instance, been judged to lose flavor due to re-processing. In a number of cases, re-processed products have received a higher flavor rating.

3. Stability and texture: Re-processed milk solids are made up of firmly held cluster particles that don't break down during packaging and handling.

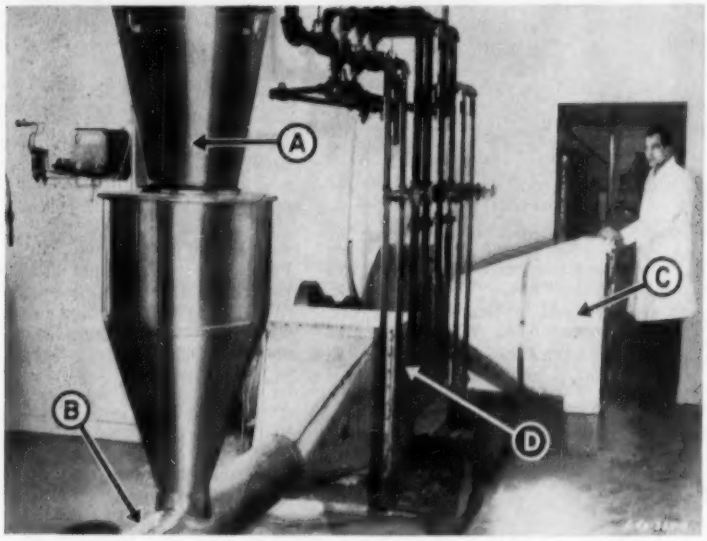
4. Keeping quality: Re-processed products, according to limited tests, seem to have excellent keeping qualities. Those held six months were equal to, or better than, similarly stored regular milk powders. Products don't tend to cake, as do ordinary milk powders.

5. Production: The new process





SCHEMATIC of A-R-C-S System. Product is conveyed to loading hopper feeding agglomerating tube. Wetted solids are separated from moisture-laden air in wet collector. They then drop through atmospheric break into re-dryer and are discharged onto shaker-cooler. Dried, clustered product passes through sizing rolls to packaging.



FROM WET COLLECTOR (A), solids enter re-drying section (B) where they are picked up by heated air. Air is filtered at (C), heated by steam coils at (D).

converts 2,000 lb. per hour of non-fat milk solids—from the difficult to the easy-to-disperse products.

Problems Crop Up

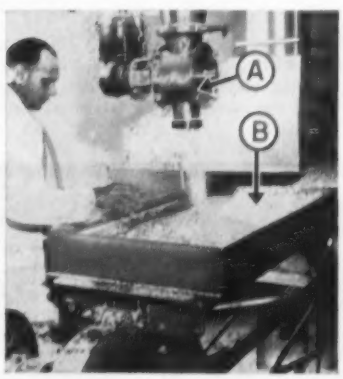
A hatful of headaches plagued C-B engineers who designed and built the new system in cooperation with White House Milk Co., Manitowoc, Wis.

Biggest one occurred at the transfer point between agglomerating and re-drying sections. Here, a positive, foolproof "atmospheric break" had to be maintained so as to prevent the system from clogging and avoid exposing the high-moisture powder to the atmosphere.

At the start, engineers of both companies worked with rotary and flapper valves as well as other powder-discharge methods. Solution was the use of dampers to balance air flow from the two re-dry section blowers (input and exhaust).

Another big headache related to air velocities in the agglomerating section. If they were too low, wetted particles fell out of the air stream, stuck to the sides of the tube, and soon fouled up the process. When too high, a plastering effect

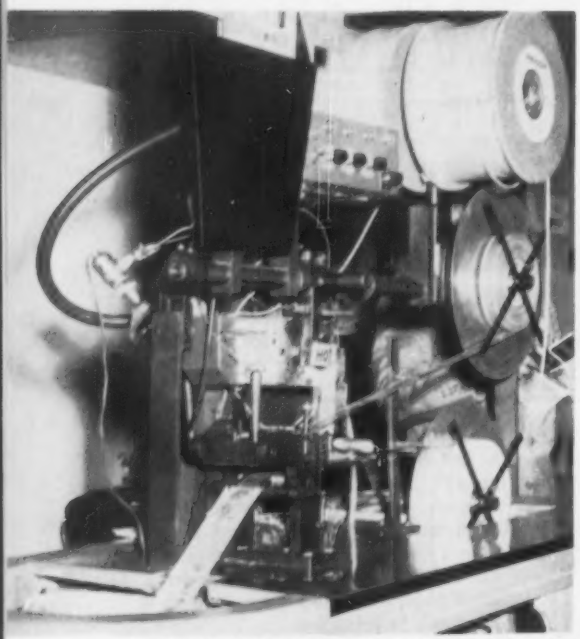
(*Turn to page 194*)



DRIED and clustered solids pass from second collector (A) to vibrating cooling table (B), then to sizing rolls.

Latest Food Packaging Equipment Seen at Big New National Show

27 advanced units targeted by FE camera at first biennial Packaging Machinery & Material Exposition in Cleveland . . . Included are new weigher-filler, pouch-former and filler, bottle cleaners, box former, wrappers, labelers, cartoners, case handlers, controllers



THERMOPLASTIC adhesive is fed in form of continuous, flexible, rope-like coil into carton-maker for high temperature-melting application. Heat controlled by 4 thermostats and 7 heating units. Eliminates filling and cleaning of glue pots, glue-supply lines. Adaptable to large range of packaging materials. Speeds up to 100 trays per min. Maker: United Shoe Machinery Corp., Boston. (64A)

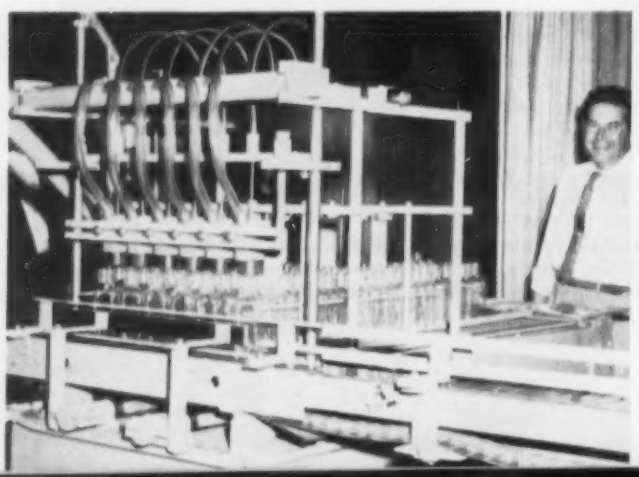
3 Show Stoppers

NEW labeling technique uses heat and pressure to transfer 3-color printed labels from paper backing onto "cello." Inked paper-backed impressions are machine-transferred from roll stock at a 100-per-min. rate.—"Therimage" process developed by Dennison Mfg. Co., Framingham, Mass. (64B). "Imagraph" transfer-applicating unit by Adolph Gottscho, Inc., Hilliside, N. J. (64C)

SPECIAL Label-dater codes by cutting series of small notches in edge of label for easy glance-reading with a code card. Labels of all sizes and shapes are worked in packets of 500 or more, and at speed up to 2,000 per min. Also codes cartons, bags, etc., without disfiguring. Method will identify any information. Exhibitor: Griffin-Rutgers, Inc., N. Y. C. (64D)

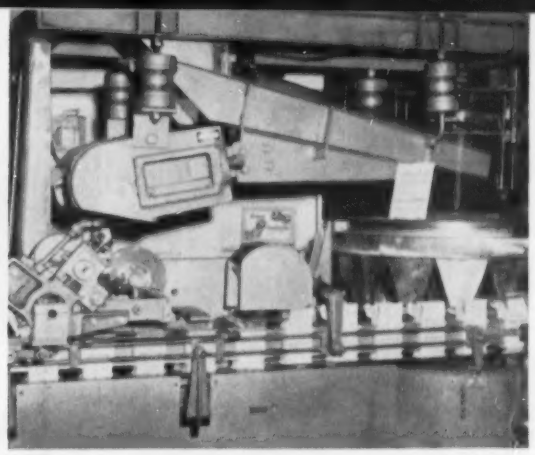
Cleaners, Fillers, Formers

DUAL feeder-cleaner operates at 300-per-min. Trouble-free units air-clean, evacuate, and directly feed bottles to filler with fewer operations and moving parts. Features: Quick changeover, accurate synchronization, and new easy-to-adjust vari-speed conveyor drive.—Mach'y Service Co., Louisville. (64E)

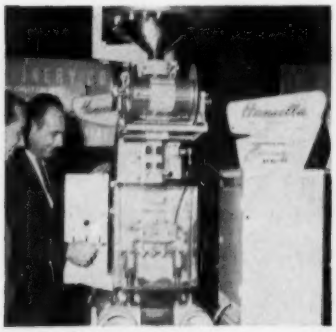


SMOOTH performing machine cleans 500 pint jars per min. Inflated Neoprene tubes firmly grip upright jars, invert them while traveling on platform-chain conveyor. Cleans by centrifugal force and air jets. Turntable-tangential container intake and discharge eliminate stars, time dials, helices, screw feeds. —Pneumatic Scale Corp., Quincy, Mass. (64F)

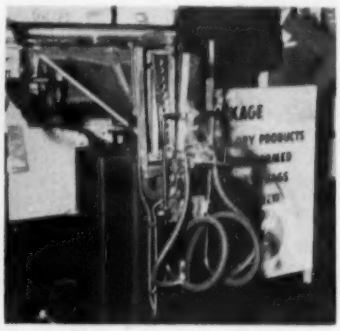
ROTARY 18-spout machine fills containers from bottom-up at rate of 70 quart bottles per min. Number of filling valves can be increased to handle up to 300 containers a min. Designed to nitrogen-blanket filling bowl to augment filling of foamy products 200-300%.—Horix Mfg. Co., Pittsburgh (65A)



350-PER-MIN. carton filler-sealer takes magazine-fed folding cartons, folds bottom, fills, and seals. Features newly designed carton feed, vibratory "Roto-Metric" feeder, gluer, and compression belt. New fill system comprises vibrating feed chute and scale to control rate of material flow as density changes.—Stokes & Smith Co., Philadelphia (65B)



MULTI-FUNCTION machine forms roll-fed Saran into a pouch that is filled and electronically sealed at 40-per-min.-rate. Features: Electric-eye registration, oil bath-immersed gears, rapid forming tube-replacement, jaws designed for different sealing jobs, and plastic safety guard for sealer. Supplier: Hansella Machinery Corp., Palisades Park, N. J. (65C)

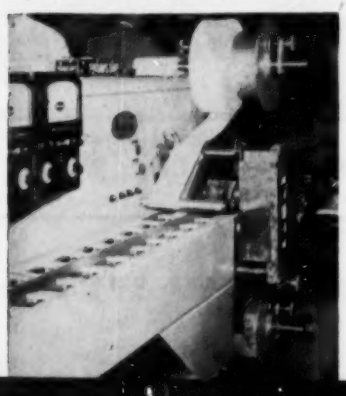


CAMPBELL-PAK unit converts thermoplastic roll stock into heat-sealed bags for sequence packaging of powders, liquids, etc., at rates up to 40 per min. Speed and bag size are changeable during operation by simple adjustments. Forms bags from 1x1 to 14x20 in., and handles films up to 6 mils thick. Maker: Hudson-Sharp Machine Co., Green Bay Wis. (65D)

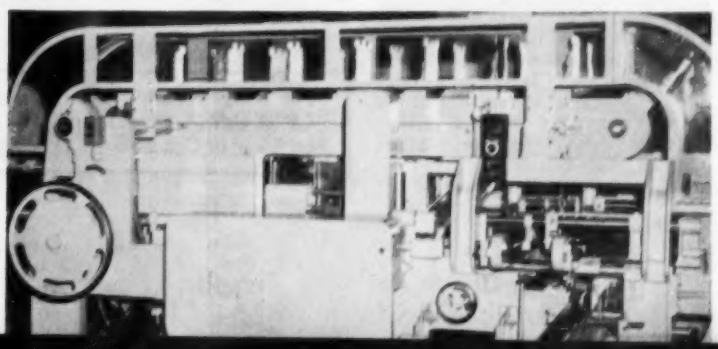
IN-PLANT corrugated box former produces up to 4,500 per day. Eliminates space formerly used to store setup cartons. Gives set-up-box advantages in folding-box space. Compact unit is simply and easily built. Adjustment, maintenance, and repair are negligible. Hydraulically controlled pressure self-lubricates many parts and provides smooth, trouble-free operation.—United Shoe Mach'y Corp., Boston (65E)

4 Wrappers

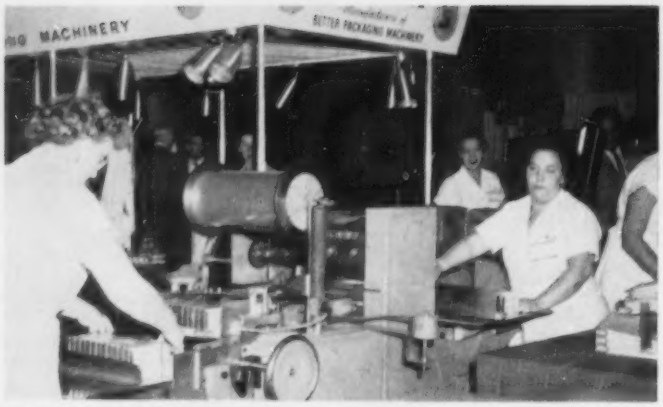
2-LINE MACHINE wraps 200 packages per min. Takes heat-sealable material from two rolls to handle items up to 1-in. high from vertical or horizontal intake. Consists of variable-speed infeed belt and Fenwal controls for heat-sealing.—Battle Creek Packaging Machines, Inc., Battle Creek, Mich. (65F)



CARTON overwrap machine features power adjustments for easy changeover to different size packages within 15 min. (instead of hours). There are two pairs of rotary wrapper folders, anti-friction ball-bearing parts, and code-dater. Operates at 100-per-min. speeds. Maker: Battle Creek Packaging Machines, Inc., Battle Creek, Mich. (65G)

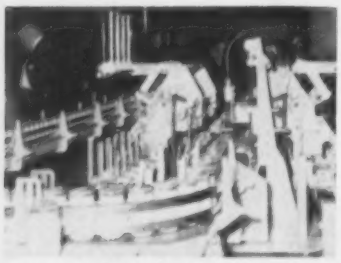


A FEW SECONDS is all it takes to change size with this machine that wraps 28 packages per min. Uses stock-size cellophane sheets held in metal trays.—Miller Wrapping & Sealing Machine Co., Chicago. (66A)



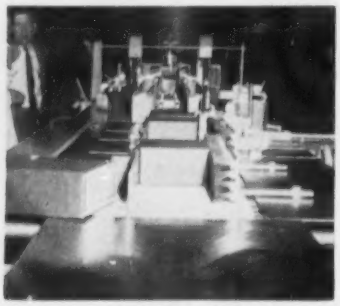
VERSATILE, adjustable machine wraps, bundles, multiple wraps, and bands at 40-per-min. Takes heat-scalable material and hopper-fed cartons or packages.—Scandia Mfg. Co., N. Arlington, N. J. (66B)

4 Labelers, Carton Unit



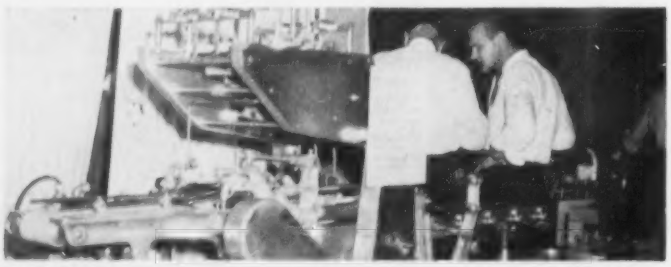
CONTINUOUS-MOTION machine labels front and back of four bottles at a time at 320 bottles per min. Has 'no-jar no-label' control, solenoid-actuated in-feed gate that indexes jars, positive container control, electric clutch, quick changeover, positive label bond, overall label gluing, simplified lubing. —Economic Mach'y. Co., Worcester, Mass. (66C)

THIS straight-through unit applies labels front and back. Innovations include circulating gluing system designed to check glue thickening and to run through clean-up water, accurate registration by suction-label handling, precise control and overall application of glue, and quick changeover. Speed: Up to 65 containers per min.—New Jersey Machine Corp., Hoboken (66D)



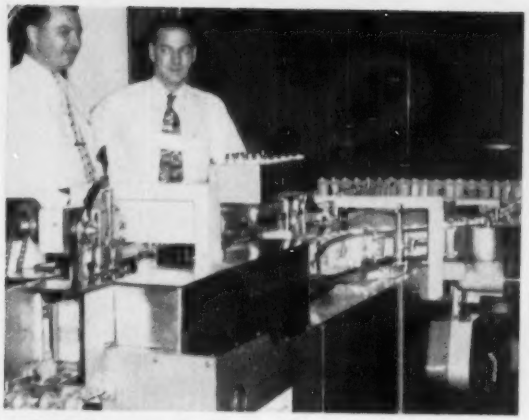
SPECIAL ATTACHMENT to fully automatic accumulating-bundling machine applies labels to side edge of bundles at 10 a minute. Attachment available for top-labeling bundles. Adapts to bundler-discharge conveyor. —Hayssen Mfg. Co., Sheboygan, Wis. (66E)

SEMI-AUTOMATIC machine applies labels to containers in upright position 40 to 50 a min. Changes over to any size or shape label or container in less than 5 min. Feed star and pressure pads are only change parts.—MRM Co., Inc., Brooklyn (66F)



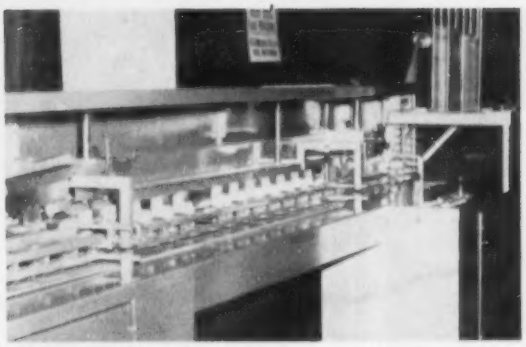
VACUUM-FEEDER attachment and glue-seal assembly for cartoning machine is designed to deliver one carton at time and is adjustable for existing carton sizes and designs. Permits full or spot gluing of end or back flaps.—Lynch Corp., Anderson, Ind. (66G)

For other recently offered package equipment, see "Spotlight on 69 Latest Units" (FE May, p. 70-82), and "New Filler, Capper, Wrapper on View in Coast Show" (FE Sept., p. 61).



MULTIPLE can cartoner handles 650 cans per min., putting 6 cans into any of four different-style cartons with positive lock and can-separator features. Manufacturer: Currie Packaging Co., Charlotte, N. C. (67A)

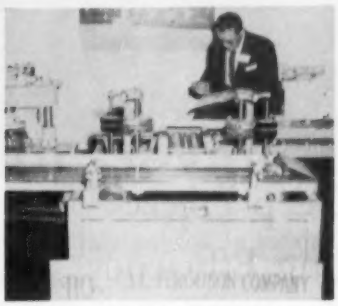
2 Cartoners



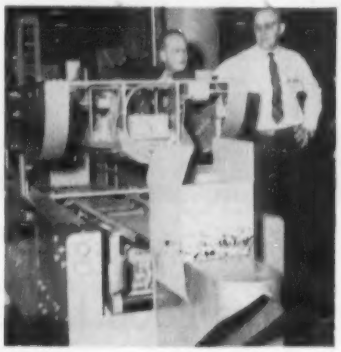
VERTICAL cartoner operates at up to 120 per min. Has easy dial and crank adjustments for carton magazine, carton-holding fingers, carton thickness, etc.—E. L. Bivans, Inc., Los Angeles. (67B)

2 Casers, Imprinter

CASE LOADER for end-opening cases runs at 15-per-min. speed. Air-operated unit designed for easy adjustment and maintenance. Can be converted into baler (inserting filled packages into multiwall baler bags or semi-rigid containers). Maker: St. Regis Paper Co., N. Y. C. (67C)



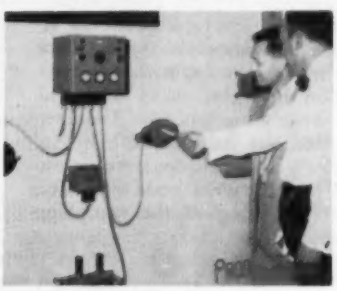
NEW, compact fully automatic unit prints 1 to 8 lines on any one or all panels of shipping cases. Unit fits at discharge end of compression section of case sealers. Prints to within ½ in. of case top or bottom.—J. L. Ferguson Co., Joliet, Ill. (67D)



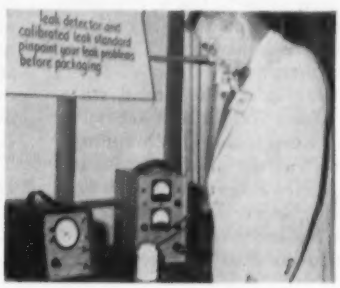
COMPACT 8-ft.-long easy-to-run unit automatically "skip-glue seals" top or top and bottom flaps of cases. Quickly adjustable for all standard size cases. Maker: Elliott Mfg. Co., Fresno, Calif. (67E)

NEW temperature controller's parts are not affected by machinery vibrations. Employs simple potentiometric circuit.—Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill. (67F)

3 Controllers



COMPLETE photoelectric registration controller insures accurate cutting of pre-printed webs used in wrapping, bag-making, and labeling.—Electronic Machine Parts, Inc., N. Y. C. (67G)



LEAK RATE is determined in any container using halogen leak standard (left) with sensitive leak detector and probe (right). Exhibitor: General Electric, W. Lynn, Mass. (67H)

The three fork trucks above are, front to rear, two *Automatic "Dockers"* and an *Automatic Skylift*. The freight cars they are unloading stand on a railroad siding deep inside this vast "refrigerator" but directly connected with the main line outside. Fifteen cars at a time can be accommodated here.

World's Largest "Deep Freeze" Boosts Food Handling Efficiency With Automatic Electric Trucks

Burrowing deep into a hillside near Kansas City, Inland Cold Storage Company's nine-acre "deep freeze" packs away *up to 2500 carloads* of foods in temperatures ranging from a cold +38° to a frigid −10° F. Nearly 100 more acres are also available for storing products which should be kept cool but not necessarily frozen. Here, insulated by hundreds of feet of solid rock the temperature is always 45°, winter and summer.

Everything is on the grand scale. While fifteen freight cars are being emptied deep inside this mammoth "ice box" at the platform pictured above, fifteen huge truck trailers are unloading at an outside dock. Fast work is needed to transfer that much frozen foods into storage without danger and here *Automatic* Electric Trucks have proved indispensable. A particular favorite is the Automatic DOCKER seen in the foreground above. Designed especially for loading dock operations, the DOCKER is unrivalled for compactness, maneuverability—shortest overall length—lowest step height—fastest lift—highest grade clearance and shortest turning radius. A number of *Automatic Skylifts* also serve in various capacities as pictured on the right.

Your own plant may be ever so different but Automatic has the Trucks you need to serve you equally well. Write today for descriptive catalog of the complete Automatic line.

Here, an Automatic Skylift is moving a pallet of chemicals from the outside loading dock into the constant temperature cold storage of huge underground cold storage plant.

Automatic®

Dept. T6

125 W. 87th Street, Chicago 20, Illinois

WORLD'S LARGEST EXCLUSIVE BUILDER OF ELECTRIC-DRIVEN INDUSTRIAL TRUCKS

21 "Don'ts" for Saving Power $$$

Heed them—and they'll quickly pay off in maximum, top-economy work per unit of fuel, steam, water, air, and electricity expended

F. J. McCLOUD
Chief Engineer

NO MISTAKE ABOUT IT, dollars saved in power bills are big dollars.

If you calculate your profit at 2½%, you can figure every one of them as equivalent to the return from $40 in new business.

True, a plant's power dollars—covering the cost of all electricity, fuel, steam, compressed air, and water used in running equipment—can be expected to sum up to a considerable total.

But in too many cases, that total is far larger than it should be—due to easily overlooked leaks, wasteful practices, and neglected machinery siphoning money down the drain, thus setting up a profit-lowering trap for the unwary food processor.

To avoid such waste of hard-earned cash, make sure your own specific operation is free from these 21 faults, found to be the most common in both big and small plants across the country—

1 Don't let idle machines run on for long periods. In some operations this is unavoidable. But you may be able to gear up your production to work heated machines continuously. This may call for even tighter scheduling during slack seasons, and more careful attention to cleanup routine.

2 Don't run water and air needlessly. If valves are in hard-to-reach places, employees frequently don't bother to turn them off. Leaking valves cause a tremendous waste of water and other process liquids. Likewise, air lines that leak at the joints cause compressors to run overtime, wasting electricity and wearing out the machine.

Re-use water whenever possible. Many processes can be adapted for this thrifty practice, and in boiler operation, re-use of condensate can mean big savings. Any recirculation cuts down on effluent disposal, a real headache in many areas.

Also, many plants save money by reclaiming Btu's from hot waste water—instead of dumping them down a sewer. Installation of a heat reclaimer does it. This unit can be a coil of tubes in a floor pit or a closed heat exchanger. Cold boiler feed or process water is passed through the unit. This preheating stage can really slash costs.

3 Don't keep work in cookers too long or reprocess unnecessarily. These faults are only too likely if operator is careless and the process is not controlled automatically. Moreover, when equipment is not loaded properly, the machine does too little work for the power it consumes, thus wasting hot water, steam, and power in direct proportion to the size of the equipment.

(Turn page)

4 Don't use compressed air for ventilation. Several cases have been found where employees use air hoses to cool machines or themselves in hot parts of a plant. This practice overworks compressor, wastes many dollars in electricity, while actually giving little cooling. An ordinary fan is much cheaper. Most effective way, of course, is to put exhaust fans and ducts at such hot points.

5 Don't lubricate improperly or inadequately. Using the wrong kind of lubricant on a machine makes it work harder. So if machine bearings get very hot during a run, be sure to find out why. If cause is a poor lubricant, seek the advice of your local supplier or the machine manufacturer. They can also save you maintenance bills in the long run.

6 Don't use incorrectly sized centrifugal pumps or fans. Most of these cases are caused by so-called temporary hookups intended to boost production. True, you save money on this kind of setup—in comparison with a complete job done by a person or firm that really knows how to size equipment. But you throw away in power bills considerably more than the cost of the standard installation. To be specific, an oversized centrifugal pump with undersized piping often runs at less than 5% efficiency. Is this good business?

7 Don't keep steam-trap bypasses open. A great waste of steam-heating efficiency is caused by employees cracking bypass valves around steam traps to get faster heating. If bypasses are needed, wire them shut or remove valve handles. They should only be used in an emergency when the trap fails, then closed again as soon as the trap is repaired.

8 Don't permit leaks in piping. Fix those joints in your steam, water, and process-liquid pipe lines so they are bone dry. Even a little drip can add up to costly bills over a year's time. Besides, leaks make a plant look messy.

9 Don't tolerate uninsulated lines. The increase in fuel bills brought about by uninsulated steam, hot water, and process lines would easily pay for a first-class insulating job. Particular attention should be paid to covering those pipes running outside between buildings.

10 Don't operate with faulty gages. If your processing equipment is laboring, or appears to need more steam when steam gages on the boilers and lines read as they should, check your gages. In some cases these instruments have been found to be "off" by 20 lb. This advice applies to all gages and thermometers in the plant. If steam and fluid pressures are kept at the proper point, equipment will operate at the proper rate.

11 Don't allow low spots in condensate return lines. In one food plant, condensate temperature in the receiver averaged about 110F. Steam traps were installed on the floor, in corners, and even under a machine. Maintenance was impossible. Particularly, the return line contained many low spots where condensate collected, bucking flow of the returning water.

After traps were replaced and low spots removed, condensate receiver temperature climbed to 180F., which increased feedwater temperature to the boiler, and thereby cut fuel oil consumption noticeably.

12 Don't Overload electric cables. As a plant grows, more motors and lights are always installed. But unless electric cables are sized at the start for future expansion, chances are they will be too light to carry the load. This causes decreased voltages that strain motors. And fuses blow out, hampering production. Replacing them with improper fuses of larger amperage can cause cables to seriously overheat, setting up a fire hazard.

It is estimated that about one older plant in every eight needs a new wiring job. This is expensive, but it pays for itself in the long run.

13 Don't let steam or water touch electrical equipment. Many plants have clouds of steam rolling up from process equipment that often short circuit electric wiring and motors, causing them to burn out. Check carefully in such areas to make sure electric insulation is not damaged. Then install exhaust fans to keep vapor away from such equipment. When motors are installed on floor, water should be kept away from the area. Remember, if electrical insulation is allowed to stay wet, sooner or later insulation will break down, and equipment will fail.

14 Don't let air compressors run backwards. Strangely enough, this happens all too often. Cause is crossing of wires when motor is installed. Biggest trouble from this condition is that the cooling fan (installed on the fly wheel) runs in reverse and thus does not cool the machine properly.

15 Don't run V-belt drives too tight or loose. To know if a V-belt has the correct tension, press down gently half way between the two pulleys. Sag should amount only to the thickness of the belt. Too much sag causes a belt to run away from the pulley on the slack side, decreasing the arc of contact be-

EXPERTS LIKE TO DO BUSINESS WITH EXPERTS

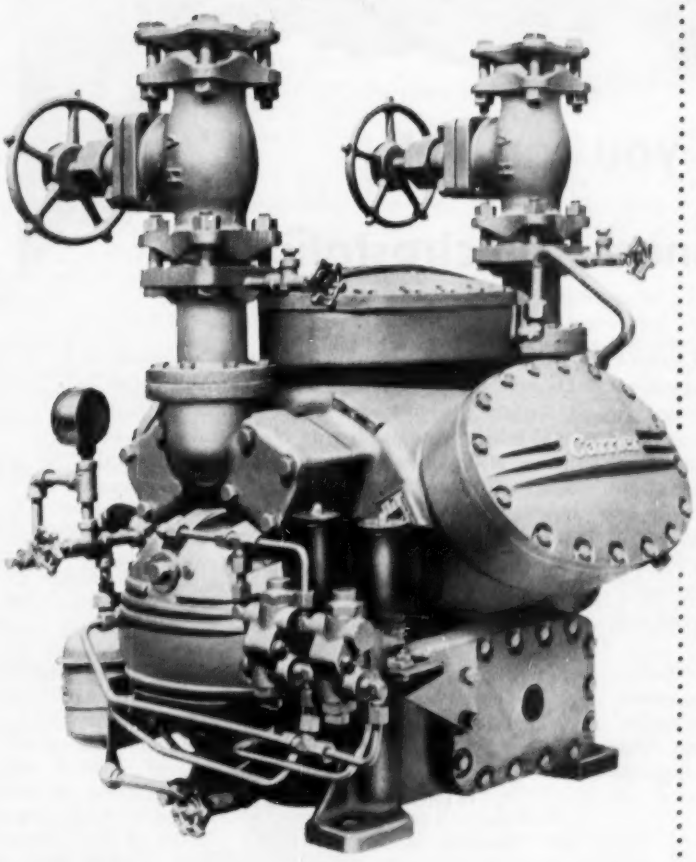
FRANCIS D. ELLIS, INC.

CHOOSES

CARRIER

AMMONIA

REFRIGERATION



This is a short-short success story. Title: "How Carrier ammonia refrigeration saves Francis D. Ellis, Inc., Philadelphia, $4000 per year."

Until recently, Francis D. Ellis (wholesale meat) was renting cold brine service from a street pipeline. When the charge for this service was raised to $5300 a year, Mr. Ellis decided to install a Carrier ammonia refrigeration system. The yearly cost of electricity to run the system is only $1300. His saving—$4000 a year. At that rate he'll pay for his refrigeration system in a hurry, then go on pocketing the difference.

What's more, Mr. Ellis claims the condition of his cut meat is better because the brine temperature can be controlled to meet humidity demands. And now he can defrost by simply shutting off the brine for a short while instead of chopping ice off the coils.

Carrier refrigerating equipment is on the job in food processing plants, large and small, all over the world — serving companies like Rath Packing Company, Waterloo, Iowa; Dole Pineapple, Honolulu; Geo. A. Hormel, Austin, Minnesota; Minute Maid, Davenport, Florida.

May we assist you?

Whether you need a complete refrigerating system or a single machine, bring your problem to Carrier. Call your nearest Carrier office. Or write Carrier Corporation, Syracuse, New York.

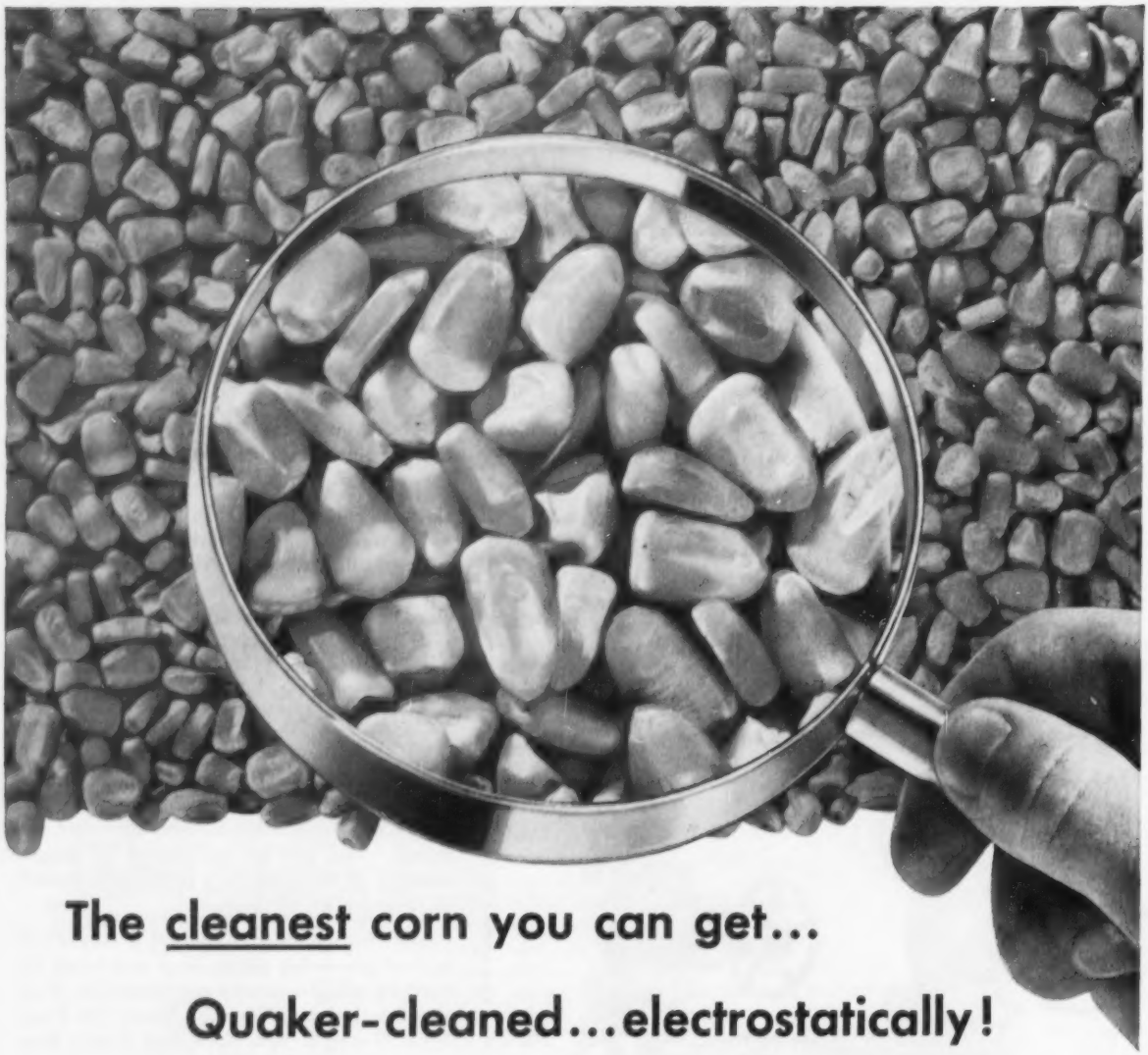
Carrier

ammonia

refrigerating

systems

For more data, circle this page number on card at back →



The cleanest corn you can get...

Quaker-cleaned...electrostatically!

No other method can touch the efficiency of Quaker's electrostatic cleaning of grain. Even removal of rodent contamination from corn is easily accomplished at Quaker.

Electrostatic cleaning operates on the ability of different particles to take on different degrees of an electrostatic charge. Other methods depend only on differences in size and weight of the materials to be separated. But because these materials carry varying degrees of electrostatic charge, Quaker's electrostatic cleaning also *removes* contamination of the *same size and weight* as the material being cleaned.

Years of testing in plant operation shows that electrostatic cleaning is able to remove far more rodent contamination from corn of commercial milling quality than other methods—without sacrificing yield. This same cleaning superiority applies to almost all grains with similar contamination problems.

Electrostatic cleaning is another example of Quaker's creative milling—producing *clean* grains to make *your* food processing easier and more profitable.

In addition to producing *clean* grains, Quaker makes electrostatic cleaning equipment (under the name CORONATRON®) available to food processors. For information about *any* processing problem—or about the purchase of this equipment—call or write Industrial Food Sales, The Quaker Oats Company, Chicago 54, Illinois.

QUAKER

Imagination in Milling—
to solve your processing problems.

← For more data, circle this page number on card at back

tween belt and pulley, and making belt tend to slip. A too-tight belt wears out faster. In multi-belt drives, all belts should be kept at the same tension if possible.

16 Don't suffer from low power factors. Select motors carefully for various uses. Example: Favor the synchronous motor and avoid slow-speed induction units. The latter have an inherently low power factor. If you're heavy on induction motors, try rearrangement, where practical, to average a higher loading. If you can stand the expense, try boosting the power factor by installing capacitors. And prevent arcing at motor switches. It causes another power loss.

17 Don't allow boilers to smoke. Biggest waste of power dollars can frequently be traced to the boiler room. One visible sign is heavy smoke rising from the stack. This is usually caused by improper fuel-air ratio, a dirty boiler, or fuel oil not at proper temperature.

In one plant, a checkerboard floor

(Turn to page 175)

• • •

Morrell Puts a Plus Into Lard

Adds golden color to top-quality, deodorized, high-smoke-point fat, for competition with vegetable shortening. Packs it in neat cans

FE STAFF

ANOTHER PLUS VALUE has been imparted to lard to help it in its comeback fight against vegetable shortening.

Color is being added by John Morrell & Co., Ottumwa, Iowa, to produce a new "Golden Lard." And the color enhances the appearance of foods fried or baked with the shortening.

The product is basically a high-quality, wet-rendered, deodorized lard. The coloring (annatto) is added —along with antioxidant and lard flakes—prior to plasticizing and packaging.

Selling for slightly more than regular lard—and about 20% less than vegetable oil shortenings—the new product has won favor with housewives in a few months.

Why Consumers Like It

Favorable consumer reaction to the product is attributed by Morrell to these qualities:

1. **Convenience:** It is put up in neat, easy-to-get-at 3-lb. cans with dressy labels.

2. **Eye-appeal:** The golden color not only makes the new lard itself more attractive but is imparted to fat-fried and baked foods.

3. **Smoke point:** Smoke point is raised to 400F. by continuously deodorizing carefully tank-rendered fat to an extremely low free fatty acid content—0.03 to 0.05%. This way, the lard doesn't "smoke up" the kitchen when it is used for frying.

4. **Odor:** Continuous, high-vacuum deodorizer produces an odor-free lard —and one that doesn't pick up odors from frying such foods as onions, fish, etc.

Now to the processing aspects:

Pertinent Processing Details

At Morrell's Sioux Falls plant, prime, wet-rendered lard is first fed through a pressure-type filter to remove red color pigments. Then it is treated at a 2,400-lb.-per.-hr. rate in an advanced type of continuous deodorizer.

Deodorizer is automatically controlled and Dowtherm-heated to treat lard in four stages—deaerate, heat, deodorize, and cool. It produces a bland, odorless, high smoke-point product with keeping quality comparable to that of hydrogenated shortening.

In operation, filtered lard is metered into the tower of the 4-section deodorizing unit, where it is first deaerated. Here, it is steam-coil heated and agitated by steam sparging while dropping through trays.

Heating is to 325F. at this point, and product is under 5 mm. of vacuum, which is maintained by an overhead steam-jet system (3 ejectors and 2 condensers).

Deaerated lard is now gravity fed to the heating section, where it is heated to 450-475F. by Dowtherm flowing through coils.

Now deaerated and heated, lard proceeds to the deodorizing section, counter-current to stripping steam. Section comprises a series of trays, below which are steam spargers. A vacuum (5 mm.) is also maintained in this section.

As lard finally continues through the cooling section, cold water coils, with aid of agitation by steam sparging, drop product temperature to 150F.

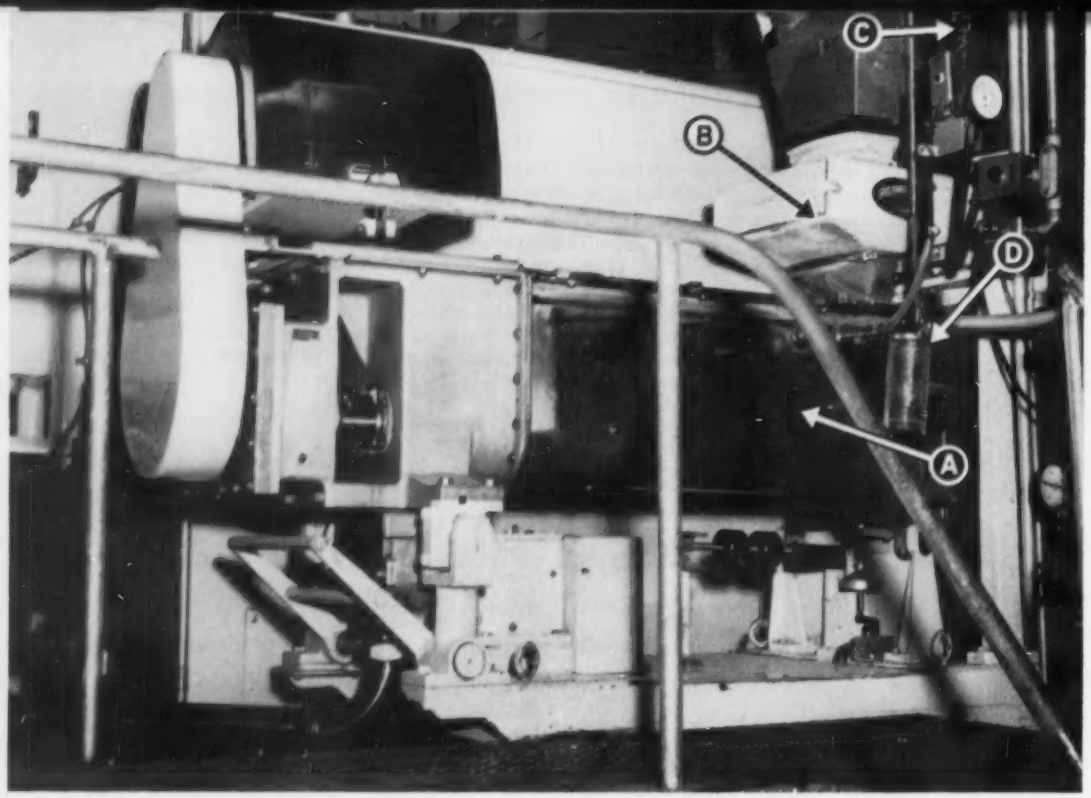
Deodorized lard is now pressure-filtered, either into holding tanks or into tank cars for shipment to the Ottumwa plant.

Tank cars, holding 60,000 lb. of deodorized lard, are equipped with coils so that they can be hooked to a steam line. At the Ottumwa plant the lard is steam-coil heated to 150F. and pumped from the cars into two receiving tanks. It takes about 2¾ hr. to unload a tank car.

From the receiving tanks, the lard is pumped to two 6,000-lb. make-up tanks. Here, it is colored, hardened, and stabilized. The color, lard flakes, and antioxidant BHA are added and blended by a Lightning mixer. These tanks are also equipped with steam coils so that temperature of the lard can be adjusted to make it free flowing.

Lard is then chill-plasticized to a smooth consistency as it is gravity-fed into a Votator-type mixer and heat exchanger. It is then filled (Globe unit) into 3-lb. cans that are sealed, labeled, and packed twelve to a shipping case.

Rate is about 5,000 lb. per hour through Votator unit and 220 cans per minute through the canning line.



HEART OF PROCESS is ingenions pre-mixer (A). Flour feeds into it through sifter (B), melted shortening enters through electrically heated pipe (C), and broth-oxidant solution through pipe (D). Flow of ingredients is automatically controlled by pre-mixer. It tilts on mounting to actuate switch that slows ingredient feed when it becomes full.

How Engineering Revolutionizes Old Art of Bread-Making

Wide tolerances for batch process eliminated by—Automatic proportioning . . . New continuous mixer that regulates flow . . . Quick dough developer with built-in divider . . . Precision pump

FRANK K. LAWLER and JOHN V. ZIEMBA
Editor and Associate Editor, "Food Engineering"

FOOD ENGINEERS have succeeded in modernizing the ancient art of batch bread-making. And against scientific odds at that.

The continuous dough process developed by Baker Process Co., Belleville, N. J. (FE, April '54, p. 88) has established itself as a cost-saving method of producing white bread with superior texture.

Success has been achieved because engineering has made unnecessary the wide tolerances required by the old batch process. Close control is built into the highly efficient, and almost totally enclosed, continuous operation.

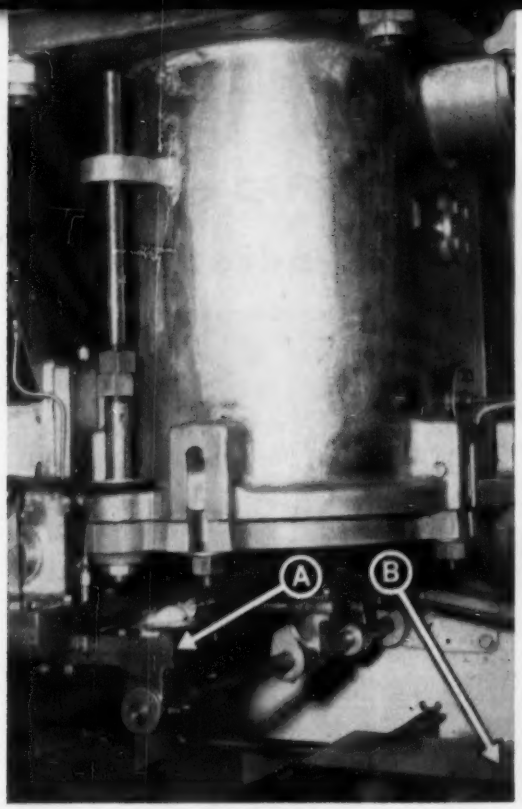
A good example of what can be done through food engineering, the process is quick and neat.

Pre-fermented ingredients are pumped through a plate-type cooler and into a continuous pre-mixer. Pumps simultaneously deliver an oxidant solution and melted shortening into the pre-mixer, and flour is continuously proportioned into the unit through a sifter. From the pre-mixer, dough is continuously pumped into a developer that extrudes it into a divider, and loaf-size pieces of dough are dropped into bake-pans (see flowsheet, p. 98).

Precise Process Control

But perfection of the process was not quite as simple as it may seem. And here are the engineering features which made the process possible:

A control panel permits pre-setting of the three ingredient pumps, dough pump, and gravimetric, belt-type flour feeder for proper flow capacities. And meters show performance to allow quick adjustment.



KEY UNITS, too, are dough developer and divider. Impellers work proper characteristics into plastic dough and extrude it through divider. Reciprocating horizontal knives (A) cut off pieces, which fall into pans (B) on conveyor below.

Pumps are driven through electrically adjusted, variable-speed units, and flour feeder is remotely adjustable. Experience shows that once these units are set from formula calculations, they stay on the beam.

Pumps moving broth, oxidant solution, and melted shortening are standard sanitary positive-displacement pumps of the rotary type. But the dough pump is a special positive displacement rotary unit developed by Baker Process to control the flow very accurately.

Heart of the control system, however, is the pre-mixer. Unit is mounted on a knife-edge balance toward the rear of its horizontal shell. When it becomes too full, it tilts enough to operate a Microswitch, thereby actuating electrical circuit to cut ingredient pumps and flour feeder to two-thirds speed. This reduces

FOR STEP-BY-STEP DESCRIPTION of revolutionary dough process, turn to picture-flowsheet, p. 98-101.

the load in the pre-mixer, causing the unit to tilt upward and actuate a control circuit that switches all ingredient feeds back to full speed. By continually oscillating between full and two-thirds input, the pre-mixer maintains proper flow of materials for designed performance.

With this arrangement, capacity of the process can be varied merely by adjusting the speed of the dough pump that empties the pre-mixer into the developer.

Amount of dough deposited in each pan can be adjusted almost instantly by changing the speed of the divider into which the dough is extruded at constant rate from the developer. Or changing speed of the dough pump to move dough through at a faster or slower rate will also alter loaf size if divider speed is kept constant.

Speed of the dough developer can be adjusted at the control panel to take care of variations in flour strength. And a recording wattmeter on the panel board shows the operator how much power the developer motor is taking—an indication of the condition of the dough and the need for speed adjustment.

To assure that an empty pan is exactly under the divider when a piece of dough is dropped, a pushbutton is provided to move the pan conveyor (pan positioner) ahead or back to achieve perfect synchronization of pan position and divider cut-off.

Speed of the pan conveyor also is metered on the control panel, and it can be adjusted at the panel itself.

Ingredient feed rates on start-up are set about 5% higher than the calculated speeds. This assures that the pre-mixer will fill and will operate on its full-to-two-thirds flow cycle.

Two Key Operations

Basic units in this process are, of course, the pre-mixer and developer. These have made continuous dough production possible—a top-flight engineering achievement first tried unsuccessfully by others several years ago, and a development long awaited by bakers.

The difficulty of the task lies in the fact that making bread dough is not just a routine mixing procedure. It involves working a plastic mass to the right cohesion and gas-retaining properties, as well as obtaining a fine dispersion of the additive ingredients in the flour.

This operation starts in the pre-mixing chamber (16x16x39 in.), heart of which is a pair of horizontal, spiral-blade agitators (6-in. dia.). These move ingredients forward and out of the unit, as pre-mixing takes place, in about 30 sec.

There is only about 74 lb. of material in the pre-mixer, compared to almost a ton in the big conventional batch dough mixers. So a fine mixing job can be done quickly.

The developer consists of two variable-speed, counter-

PROOF OF PROCESS is this random slice of Purity bread made with it. It has texture resembling that of angel food cake, is very uniform. Consumer demand indicates that the taste is there, too.

CONTINUOUS DOUGH-MAKING starts in these stainless steel, agitator-type fermenters, in which broth is prepared, then pumped (in pre-set amount) through heat-exchanger for delivery into pre-mixer.

rotating vertical impellers in a short, vertical, oval-shaped bowl. These impellers work the plastic dough mass to develop proper characteristics, at the same time moving it along continuously and extruding it into the divider. It takes only 90 sec. for dough to pass through the developer. So it is converted in record time from a material with little cohesion and gas-holding ability, to one with fine gas-retaining properties that produce the superior-textured loaf.

Built for Sanitation

All parts of the process in contact with product are of stainless steel or aluminum construction. And this virtually closed system is highly sanitary.

No flower dusting is needed, and there is no spillage of ingredients. Thus, many of the cleaning- and pest-prevention headaches of the conventional bread bakery are eliminated.

The system is easily cleaned, too, after each day's run. Pre-mixer is filled with water, and it and the developer are operated so that they virtually clean themselves. Then they are drained, and any material remaining in them is flushed out with a hose. To make this easy, there is a removable lid on the pre-mixer, and the bottom of the developer opens.

Saves Labor, Space, Material

But the sanitary advantage is but one of the pay-off features of the process. Two men operate the system. The equipment takes but 700 to 1,000 sq. ft. of floor space—only one-third to one-fourth as much as the conventional sponge-dough operation. And floor space is worth good money in these times when expansion is the order of the day.

Then there is a saving in ingredient costs, and a reduction in give-away through overweight.

A big economy factor in this operation is the precision of the divider. Loaf weight is controlled within a few grams, effecting a saving of about ¼ oz. in overweight per loaf compared with conventional equipment. This can run into quite a sizable dollar saving in a year's operation.

Total direct operating saving is 31¢ per 100 lb. of product. This breaks down as follows: Labor, 8¢; formula ingredients, 17¢; accessory ingredients, 6¢.

In capital investment, the process runs about the same as conventional equipment when installed in an existing bakery, but less when "designed into" a new plant.

Additional Attributes

Designed for flexibility, the process will make 1 or 1½-lb. open-top loaves or 1, 1½, or 2-lb. sandwich loaves. And you can change from one to the other in about 30 sec. by adjusting the divider.

The process has been operated at a capacity of 57-59 1½-lb. loaves a minute, and 70 1-lb. loaves. Capacity will vary with flour strength.

It is even considered feasible to adapt the process to rolls and buns. But this is something for the future.

One feature of bread made by this method is the higher permissible moisture content. Loaves up to the legal limit of 38% moisture can be produced.

As to ingredient specification, the process requires flour with good mixing tolerance. But almost any type of flour with that property may be used. Whole wheat, rye, and Hollywood-type breads have been made by the process, but it is being used primarily for white bread. It is not considered feasible to produce a raisin product because mixing would chop the fruit.

New Installation Pays Off

Purity Baking Co. recently installed the process at its Decatur, Ill., plant. And the company's advertising presents the new bread to consumers as a "batter whipped" product. The fine texture produced by the

IF YOU CAN or PACK any one of these food products

a Waukesha P. D.* Sanitary Pump will pump it

WHY WAUKESHA

Positive Displacement and Slow Speed—no product damage . . . no aeration . . . no agitation.

Corrosion-Resistant—no product contamination, no impairment of flavor.

Sanitary—easy to clean and keep clean, no chance for dangerous bacteria formation.

No Leakage—Sanitary O-Ring Seal completely seals out air . . . seals the product in.

Sturdy Construction—designed for long life, a minimum of maintenance.

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Versatile . . . since it handles many types of food products equally well . . . since it takes a minimum of time to disassemble, clean, sterilize and reassemble . . . it, therefore, can be easily transferred to many pumping jobs.

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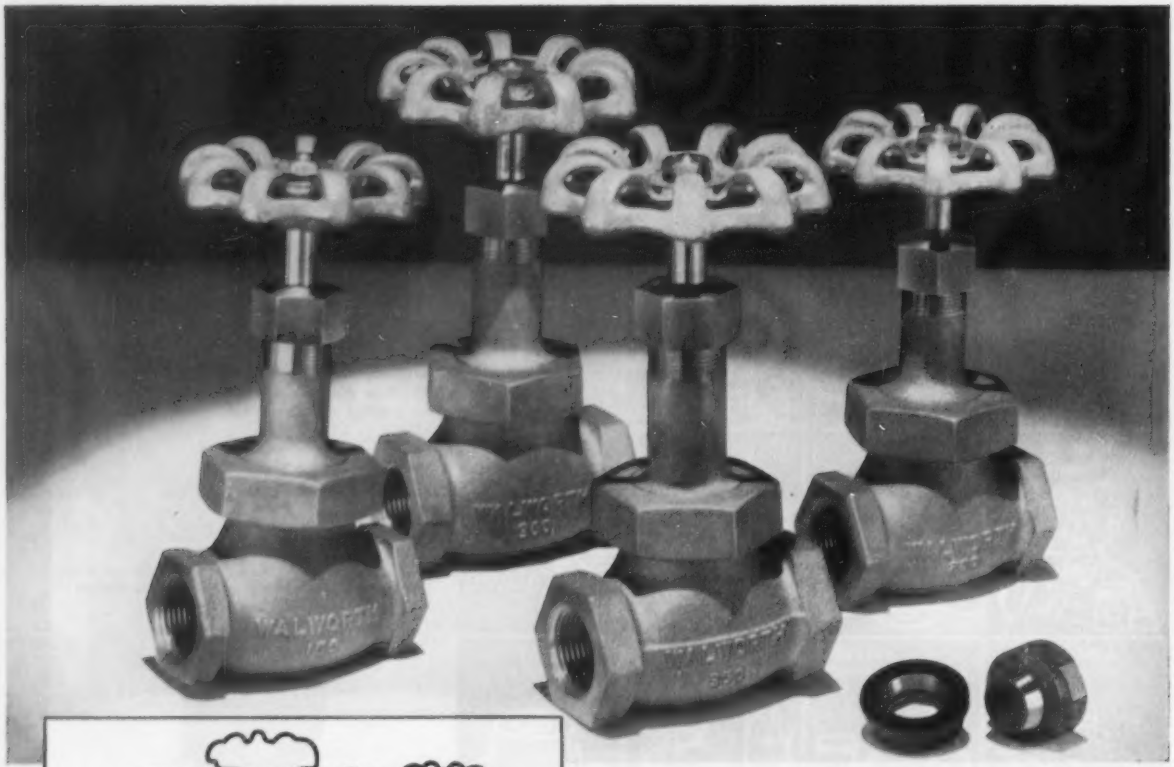

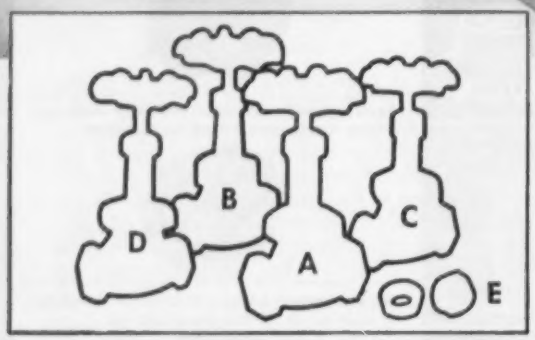

A — No. 225P . . . . . 350 WSP 550F, 1000 WOG
B — No. 260P . . . . . 300 WSP 550F, 600 WOG
C — No. 245P . . . . . 200 WSP 550F, 400 WOG
D — No. 237P . . . . . 150 WSP 500F, 300 WOG
E — "500 Brinell" Stainless Steel Plug Type Seat and Disc

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• **Deep Stuffing Boxes with Glands** are fitted with reinforced, molded packing. Valves can be repacked under pressure when fully opened.

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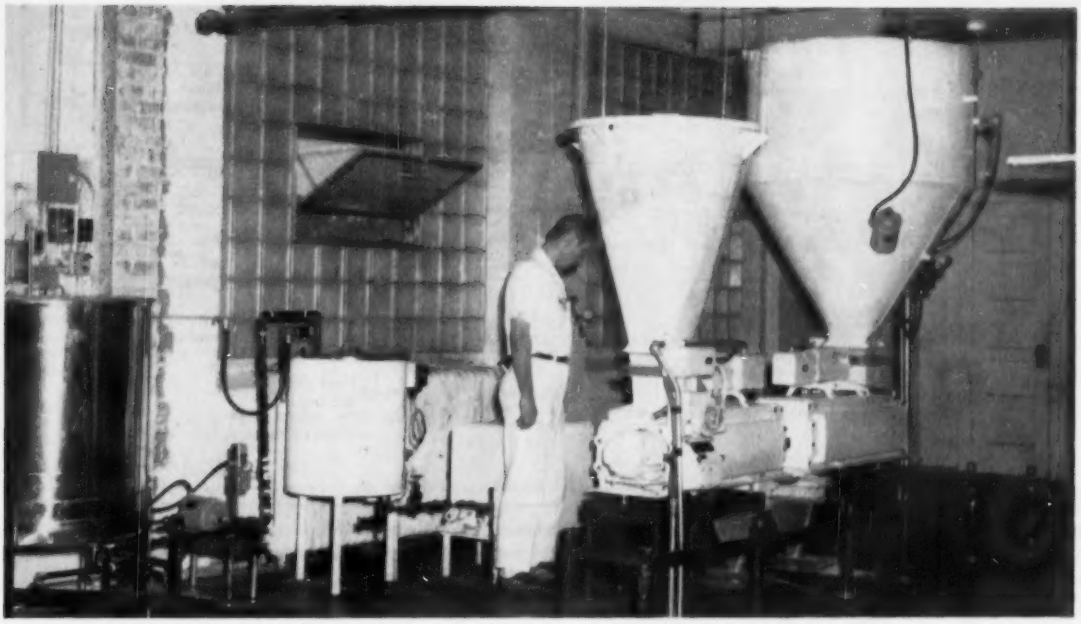


OTHER INGREDIENTS are prepared for feeding into dough pre-mixer in pre-set amounts. Prepared, here, are shortening (left), and flour (right). Shortening is proportioned into pre-mixer by pump; flour, by gravimetric feeder.

"perfect" small-quantity mixing is extolled, this operation being compared to home-kitchen mixing. The fact that slices toast uniformly is still another sales point.

According to President H. L. Budde, Purity adopted the new process primarily because of the housewives' overwhelming acceptance of superior quality loaves.

And Plant Manager Willard Brown points to production advantages. Cost savings are accomplished through elimination of flour-scaling units, batch mixers, fermentation room, dough troughs and hoists, separate divider, rounder, overhead proofer, and molder-panner. Abolished, too, are steps involving the preparation of sponge, greasing of dough troughs, and floor time.

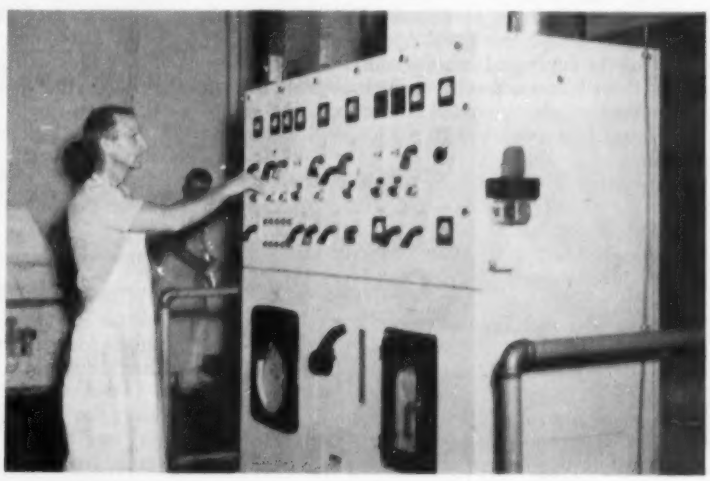
Seven of the continuous dough processes have been sold, and twelve more ordered. Two of these orders are repeats from satisfied users.

The installations are making bread for consumers in widely scattered areas—New England, the Midwest, and the West Coast. So the success doesn't hinge on a local or regional taste peculiarity.

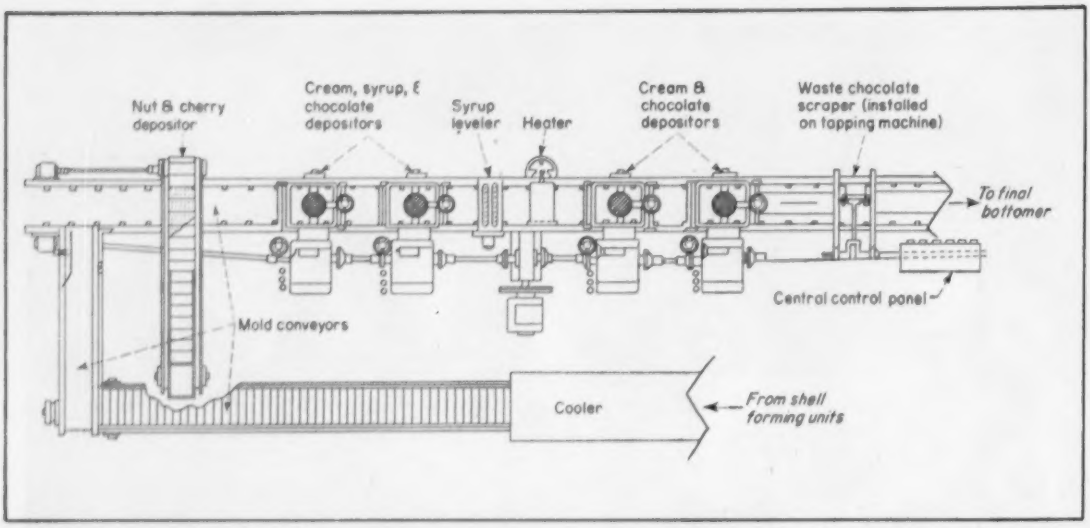
It is significant that the oldest installation, made in November, 1953, was operated on an experimental basis only 2 to 4 hr. a day, until March, 1955. It was that long before My Bread Baking Co., New Bedford, Mass., decided to go all out with it.

But an installation made last October produced good bread from the first time the ingredients were put through the process. And in two weeks the baker put it into full-scale commercial operation.

The first baker, incidentally, has a second unit on order—because his bread business has now greatly increased.



OPERATIONS of continuous dough mixer are controlled from this instrument panel.



HEART of the newly expanded chocolate line is this section where molded shells are filled. Here, molds enter by conveyor from cooler (lower right), and circle to nut or cherry depositor by transverse conveyor. Battery of four chocolate, cream filling, and syruping depositors can be interchangeably combined for different products.

This 'New Link' in Candy Line Multiplies Varieties

Quintet of machines boosts types that can be turned out with continuous setup. Three of units—nut-and-cherry depositor, liquid-leveler, and chocolate-shell heater—represent brand new engineering

FE STAFF

EVEN GREATER FLEXIBILITY has now been built into a recently-developed continuous chocolate line by the maker, Carle & Montanari, Inc., Hackensack, N. J. (originally reported in FE April, p. 90).

Sparking the latest gains are five additional machines—three of them brand new—that make it possible to turn out nut candies, cherry cordial confections, and multi-layer chocolate fondants with high-speed, automatic precision.

Basic operation of the line, which is rated at 800 candies per minute, remains the same. All the new machines are located at a point following the shell-forming operation—in a space formerly occupied by conveyors and a single cream depositor.

Places Nuts and Cherries

First of the innovations is a nut and cherry depositor (see photo and diagram). This unit consists of an ingredient hopper and a series of aluminum plates, joined closely together on two chains. The plates have holes bored through them that correspond in spacing and number to the impressions in the chocolate-line molds.

Amount of whole or crushed nuts that are added to each candy is accurately regulated by size of the bored holes, and the allotment can be changed by substituting another set of plates in the device.

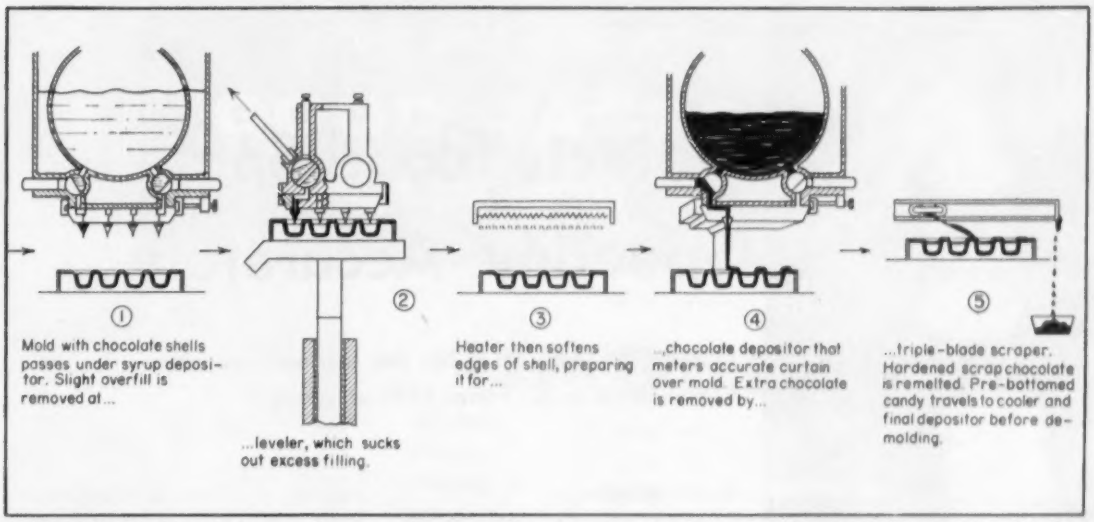
As plates pass through the hopper, each hole picks up its charge of product. This is prevented from falling through the holes by a sheet metal tray, over which the plates slide.

When a chocolate mold is in position, it actuates a cam arm that pulls a slide valve—allowing nuts or cherries to fall into the corresponding mold impressions. Plates then circle back under the machine to the hopper.

Depositors Come Next

Complete flexibility of the line can best be appreciated by describing the interaction of the work-horse units—four piston depositors that dispense cream, chocolate, or syrup as required.

Two of these devices are positioned immediately after the nut depositor and can be used either singly or together to form single-cream, nut-and-cream, or multi-layer-cream confections.


①
Mold with chocolate shells passes under syrup depositor. Slight overfill is removed at...
②
...leveler, which sucks out excess filling.
③
Heater then softens edges of shell, preparing it for...
④
...chocolate depositor that meters accurate curtain over mold. Extra chocolate is removed by...
⑤
...triple-blade scraper. Hardened scrap chocolate is remelted. Pre-bottomed candy travels to cooler and final depositor before de-molding.

FORMATION of liquid cherry or liqueur candies is traced in this schematic. Piston depositors inject fillings or chocolate into a depositor plate fitted with up to 36 nozzles. Here, chocolate unit is equipped with curtain-flow plate. Leveler gives extremely accurate spacing for chocolate bottoms.

In making liquid cherry centers, the units are particularly useful. For with the pre-formed shells, liquid centers can be added in the form of cold syrups. Hot, inverted fondants—that might melt chocolate shells—are thereby eliminated.

In action, depositor fills the mold impressions with syrup. Molds then pass to a new leveling device that sucks out a small amount of syrup. This leaves a uniform space for the bottoms, and gives extra-close control of liquid content.

After passing under a newly designed electric heater that warms and softens edges of the chocolate shells, molds pass through two more depositors for addition of chocolate pre-bottoms.

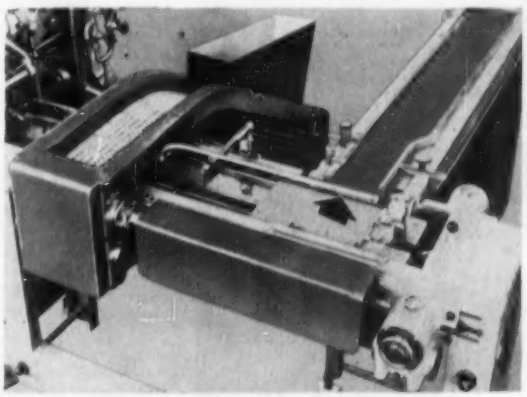
With cherry chocolates, only one of these machines is needed. But both machines are used as chocolate and cream depositors for candies having multiple layers.

Removal of excess chocolate from bottom of molds is accomplished by a scraper, attached to a tapping table (a device for leveling fillings and insuring even chocolate bottoms). The scraper—similar to two other units located at other points in the line—removes the surplus chocolate from the pre-bottoms by means of three knives that pass over the mold surface without damaging even the thinest shell.

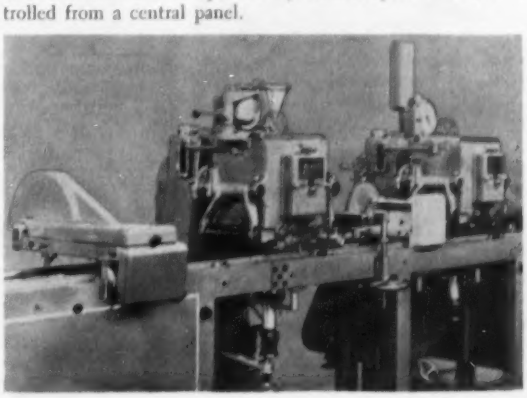
The rest of the line is unchanged. Molds move through a cooling tunnel, and pass a final depositor, scraper, and tapping table for application of the complete chocolate bottom. After further cooling, candies are automatically de-molded.

Chocolate eggs, or any other hollow items such as are popular for Easter and Christmas, can also be made on this line by coupling molds together in a semi-manual operation. Of course, de-molding of these products is done partly by hand, too.

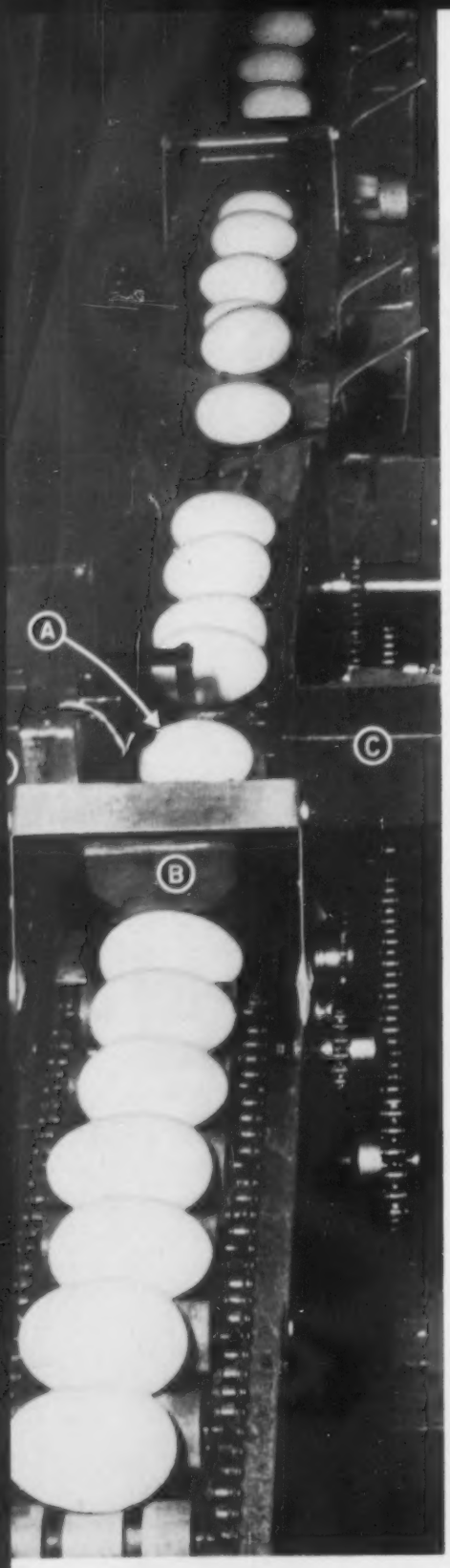
To control operations on the new line, all instruments, motor switches, and controls are grouped on a three-section, central regulating panel. Here, one operator can oversee the entire line for both filled candies and solid bars.



NUT AND CHERRY DEPOSITOR employs perforated aluminum plates to pick up ingredients from hopper (rear). Cam arm (arrow) releases plate contents into molds (not shown here). Conveyor then moves molds through . . .



. . . BATTERY OF DEPOSITORS (two shown) for addition of various fillings. Automatic leveler for liquid fillings is seen at left. Entire line is operated by variable-speed drives, controlled from a central panel.



AS EGG (A) is positioned in detector, baffle (B) moves forward, actuating solenoid that enables light beam from (C) to pass through egg and be analyzed at (D).

Detects Blood Spots Speedily, Accurately

Unit inspects eggs at 7,200 per hr., and separates unacceptable ones. Forsee 98% efficiency

H. C. HOOD

Engineering Editor, McGraw-Hill Pacific Coast News Bureau, Los Angeles

AT THE PLANT of Hofman-Jackson Egg Co., Anaheim, Calif., an electronic candling machine is now detecting presence of blood spots, or bloody albumen, and automatically rejecting eggs containing them.

The machine, manufactured and installed by Librascope, Inc., subsidiary of General Precision Equipment Corp., automatically diverts blood-containing eggs into a reject alley, and permits acceptable ones to pass to conventional weighing machines and on to packaging for market.

Basic idea behind the detector is the fact that avian blood absorbs certain light bands of the visible spectrum. So by projecting light through the shell into the egg albumen it is possible to detect extremely small amounts of blood.

Signals are then multiplied to values adequate to actuate electrical solenoids which, in turn, operate mechanical devices to reject the un-acceptable egg.

Automates Packing Line

For some time, satisfactory machines for segregating eggs into the usual four weight categories have been available to packers. And recently, several units capable of automatically weighing, oiling, and cartoning eggs have been developed. But in the realm of candling, the same archaic methods used by the ancient Egyptians to determine acceptability persist throughout the field.

Agile-fingered operators rotate each egg in a beam of incandescent light, generally in a darkened area to reduce influence of outside light. The experienced candler quickly discerns checks or breaks in the shell, presence of black or green rot, and size of egg's air-cell. But primary concern is with detecting presence of internal blood, which may vary from tiny pinpoints to a suffused condition.

At best, manual candling is a tedious job, and its accuracy is frequently questionable. A good candler can maintain a speed of one egg per second for a short time, but the average rate throughout a day is considerably less. Also, an accuracy of only 55% is considered very good.

On the other hand, the Librascope tirelessly detects all but the smallest amounts of blood. It scans eggs at the rate of two or three per second, or better than 20 cases (7,200 eggs) per hour and there is no fatigue factor.

Closeup of Unit's Operation

Company engineers are keeping close tabs on the recently installed machine, and it is hoped that it will discern the presence of blood with an accuracy of approximately 98%.

Eggs from Hofman-Jackson's 210,000-hen laying coops are unloaded onto a conventional "singulator." Here, they are "walked" (by a series of slowing moving wooden rods) to the end of the unit, and then eased, single-file, onto a flat, chain-driven conveyor, consisting of a series of spools. These orient the eggs so that their major axes are perpendicular to direction of travel.

At the detector, they are picked up one-at-a-time by a rubber-pocketed sprocket wheel, which

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(HOLLOW-FLITE)

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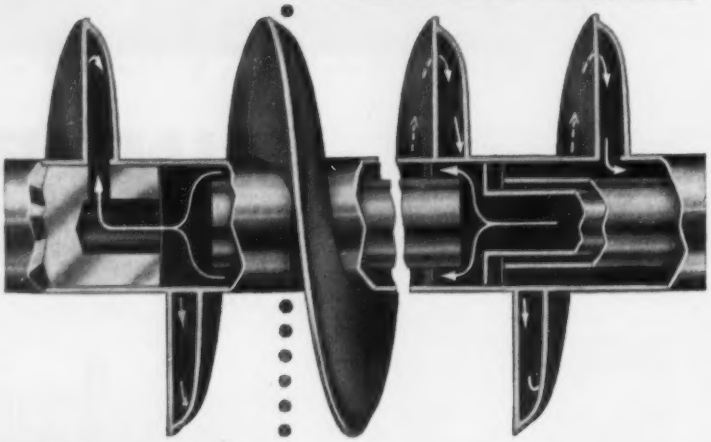
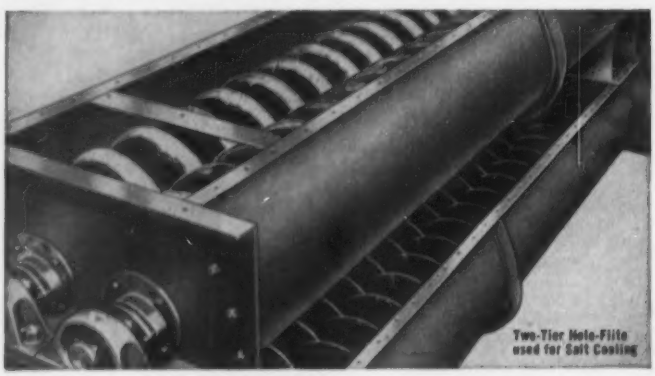
▶ Up to 80% Saving in Space!

▶ Permits Continuous, High Efficiency Operation!

Backed by the same well-known organization that pioneered COTTRELL Precipitators, MULTICLONE Collectors and other leading products, the HOLO-FLITE Processor represents a far-reaching advancement in the science of heat-exchanger design. Widely adaptable to various types of cooling and similar applications in industrial processing operations, the HOLO-FLITE handles powdered or granular solids, moist pastes or slurries with equal facility. Moreover, it requires as little as 1/5th the space of other heat exchangers . . . causes no dust, therefore requires no costly or complicated auxiliary recovery equipment . . . and maintains its uniformly high efficiency under modern continuous-flow operations (no stop-and-go "batching" operations are necessary).





Two-Tier Holo-Flite used for Salt Cooling

Unique Simplicity

Basically, the HOLO-FLITE consists of two or more hollow intermeshing conveyor screws that slowly rotate in a trough or tube. The cooling agent circulates through the hollow flights and shafts of the conveyor screws while the product itself "flows" in the trough where it is constantly rotated into, around, over and under the moving heat-exchange surfaces. The continuous mixing, turning, folding action causes a constant change of contact with the heat-exchange surfaces and results in a high rate of heat transfer. Yet the action is so gentle that there is no dusting and little, if any, abrasion of crystalline particles.

Unlimited Capacity

HOLO-FLITE Processors can be readily adapted to virtually any capacity requirement and are in daily operation on such varied products as sand, cement, cottonseed cake, soybean meal, borax, salt, sugar, baby foods, and many other products. Cooled products can be packaged directly from the HOLO-FLITE discharge, saving time, space and additional handling.

Be sure to investigate HOLO-FLITE savings before you install heat-exchange equipment. To insure maximum operating efficiency at low overall cost, each installation is individually engineered to the job using basic stock-size elements. Contact the nearest Western Precipitation office for further details on the revolutionary HOLO-FLITE Processor—or write direct!

FREE! New 8 Page Bulletin describing HOLO-FLITE features and applications will gladly be sent on request!

*Reg. T.M.

A FEW OF MANY HOLO-FLITE ADVANTAGES

WIDE ADAPTABILITY: HOLO-FLITE handles fine-grained, crystalline or powdered solids, pulps, pastes and slurries with equal ease. Heat transfer agent can be refrigerant, cooled or ambient water, or other fluids to provide a wide range of processing temperatures.

SPACE-SAVING COMPACTNESS: Because of its large active heat-transfer surface per cubic foot of space required, the HOLO-FLITE requires only a minimum of space—is 5 to 6 times as compact as other equipment of comparable capacity!

LOW POWER REQUIREMENTS: HOLO-FLITE conveyor screws rotate slowly—usually only 1 to 12 r.p.m. Further, multiple tiers can be driven by one motor, assuring low power consumption.

INSTALLATION FLEXIBILITY: The basic HOLO-FLITE unit is two intermeshing screws in a single trough, but four or six screws per trough can also be installed. Moreover, any number of troughs can be "tiered" on top of one another—trough lengths can be varied from 8 to 20 ft.—screw diameters can be varied from 7" to 16"—to provide virtually any desired capacity in a minimum of space!

Write for full details on the many savings the HOLO-FLITE *Processor can bring to your particular applications.*

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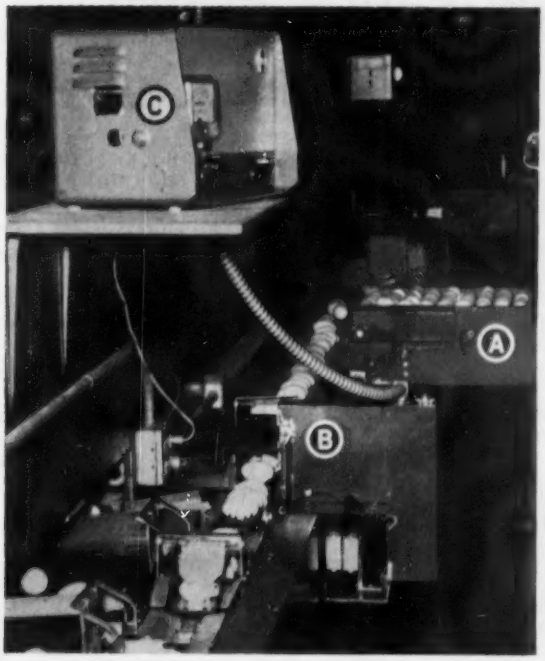
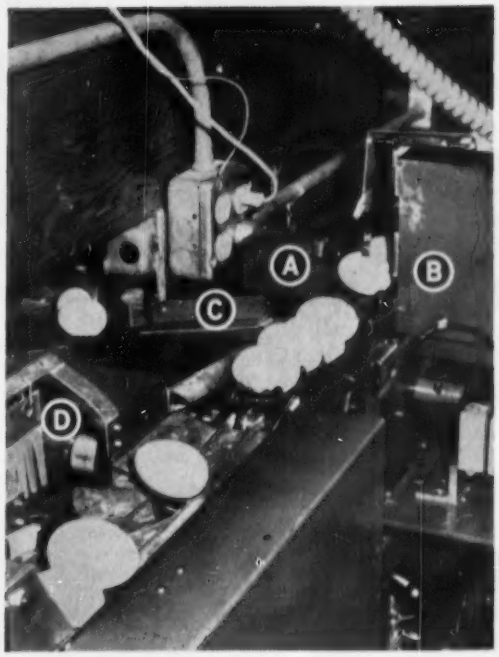
PRECIPITATION CO. OF CANADA, LTD., DOMINION SQ. BLDG., MONTREAL

Closeups Pinpoint Blood Detector's Operation



EGGS are placed in singulator (A), which aligns and deposits them on spool conveyor that feeds detector (B). Electronic controls for unit are shown at (C).



APERTURE in lamp housing (A) permits light to pass through egg to detector (B), which diverts defective ones to chute (C). Acceptable ones are weighed (D).

cradles and positions them in the beam of candling light. Driven by a cam-and-ratchet indexing mechanism, this "ferris wheel," as it is dubbed by company engineers, hesitates for ¼ sec. as each egg moves into position between candling lamp and light-receiving aperture on opposite side of conveyor.

Actuator arm of a mercury switch extends downward into the path of incoming eggs, and is tripped by an egg moving into position before the lamp. Then a solenoid causes aperture shutter to be momentarily drawn back. It is during this fraction of a second that the analyzing system of the machine makes its "decision." Actually, it requires only 1/5 sec. to do its work.

In case an egg contains blood, a ramp is raised in its path as it exits from the viewing station. This diverts the unacceptable egg from its normal travel toward the weighing machines, causing it to roll off to the side and into the reject alley. Ramp then drops to bottom of conveyor, allowing subsequently judged bloodless eggs to continue to the weighing machine.

After leaving the detector, which occupies only some 10 in., eggs are automatically sorted according to weight. Those weighing over 23 oz. are jumbos; 20-23 oz., mediums; 17-20 oz., small; and all under 17 oz., pee-wees. It's done with carefully adjusted balances.

Special Safety Features

The detector is equipped with a controller that smoothes out irregularities in line voltage. It operates on 110v. a. c., and consumes 60w. of power. Varying thicknesses of egg shells passing before the lamp in no way alter the machine's decisions. Actual amount of light transmitted to photoelectric cells may thus vary, but correct functioning of the detector is not jeopardized.

However, if intensity of light transmitted to detector drops to an extremely low level—because of lamp failure or an unusually dense egg—every egg will automatically be rejected. It then becomes obvious to the operator that something is wrong. So he shuts down the machine, replaces the bulb (if it is burned out), and re-runs only those eggs past the reject station.

If it were not for this "fail-safe" feature, he would have to re-run all of the previously scanned acceptable eggs.

If the fault happens to be with one of the circuits, this is also quickly remedied, since all circuits are of the plug-in variety and so easily replaceable.

Company engineers suggest that reject stations be provided to accommodate 5% of the total number of eggs being run. This figure is purposely on the high side, because rejects seldom number more than 2-3%.

Food Systems, Inc., of Oakland, Calif., is acting as exclusive distributor of the detector in the continental U. S. and Canada. It plans to make ten local installations. Improvements and new features stemming from operating experience on these installations will be incorporated in future models, to be generally available.

The detectors will be installed on a lease basis, with rates based on number of cases run.

New Fancy Foods, Packages Make Debut

ERSATZ LEMON looks and feels like the real thing—but it holds four times as much juice. British-made ReaLem holds 2½ oz. of pure juice, fortified so refrigeration is unnecessary. Packed six to a cardboard crate, product will soon be distributed nationally.—Murdan Foods Co., N. Y. C.

A WEALTH OF LATEST IDEAS in specialty foods and their packaging was paraded at the National Fancy Food & Confection Show recently held in New York City.

More than 4,000 items from 40 nations reflected processors' national response to the new zooming demand for fancy foods. This second exhibition showed a 50% increase in participation.

Items displayed alternated between new and unusual food products and bright, imaginative packaging for conventional products. Also noted was a trend toward American packaging of foreign products.

A $7 million increase in fancy food imports during the first five months of 1956 is evidence of the growing American market.

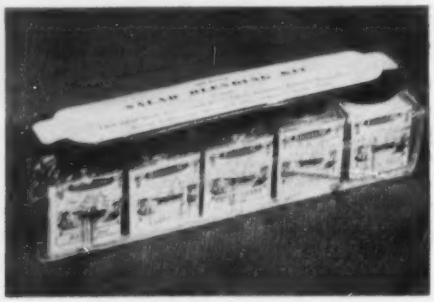
According to the National Assn. for the Specialty Food Trade, there are two reasons:

►Traveling Americans are developing a taste for foreign food products.

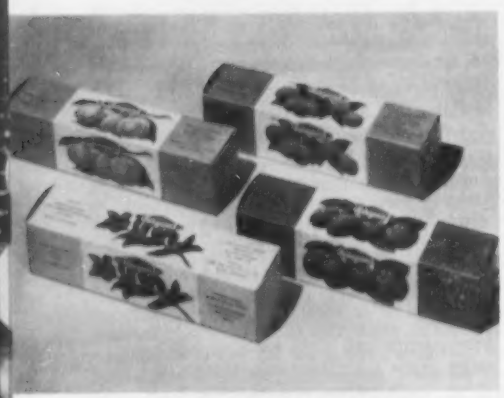
►Trend toward informal home entertaining means that housewives are serving more fancy foods for snacks and canapes.

MADAGASCAR VANILLA powder is packed in ¼-oz. metal vial at Evanston, Ill., by Charlotte Charles Inc.

FRENCH MUSTARD in three attractive packages—Left: Apothecary jar is container for Captiva mustard. Center: Moutarde Florida accentuates champagne-base recipe with wine bottle jar. Collapsible tube is refill. Right: Parizot mustard is in pottery jar.—Bruno Scheidt, N. Y. C.



SALAD HERB BLEND is one of six kits in line. Each holds five bottles of seasoning packed in cello-overwrapped plastic tray. Other kits are barbecue cookery, seafood, and three regional sets: Down East, Pennsylvania Dutch, and Deep South. —R. C. Bigelow Inc., Norwalk, Conn.



TUBE-PACKED preserves from Switzerland are of apricot, strawberry, raspberry, and lingonberry flavors. Sargans Canning Co. packs them in 7-oz. metal tubes. —T. G. Koryn, N. Y. C.

HOLIDAY CONFECTIONS from Italy are quadruple-wrapped to protect quality. Cellophane covers cardboard box. Product is wrapped in both foil and waxed paper before being placed in carton. Ingredients for cakes are almonds, candied citron, orange sugar, flour, and flavors.—Peter Grogan, N.Y.C.

"CHAMPAGNE CORK" is actually foil-wrapped chocolate cream from France. Foil protects quality as well as adding eye appeal.—Andre Prost Inc., N. Y. C.

CLOSE-PACKED peeled cocktail shrimp are put up in sardine-type can. Salt is added to the 3¾ oz. of Norwegian sea shrimp.—Arnold Food Specialties, N. Y. C.

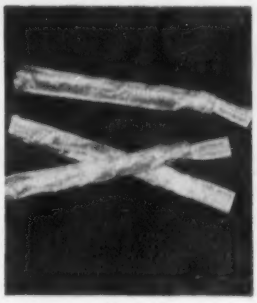
NO REFRIGERATION is needed for Lacroix Sauce Hollandaise. No fortifier, artificial color, or flavor is added to the 4¼ oz. of West German sauce.—Cresca Co., N. Y. C.

PIZZA SPREAD is one of seven made with cheddar base. Others are clam, carroway, limberger, onion, old smoke, and all cheddar.—Original Herkimer County Cheese Co., Herkimer, N. Y.

4 New Ideas for Tea

OLD-FASHIONED CANNISTER holds 100 bags of choice Darjeeling tea. A British export, it's bright red lacquer item with oriental motif.—F. P. Garrettson Co., Baldwin, N. Y.

ALUMINUM TEA BALLS from Italy each make two cups. Globes of tea are packed in individual Pliofilm bags in boxes of 6, 24, 48, 100.—Arnold Food Specialties, N. Y. C.



FOIL STRIPS hold herb teas. Shape is adapted to traditional European method of serving tea in tall glasses —Institutional trade. Andre Prost, Inc., N. Y. C.

DELFT CHINA TUMBLER is unusual and attractive container for Niemeijer's tea. Polyethylene lid seals it.—H. Hamstra & Co., Clifton, N. J.

PAST AND FUTURE motifs are evident in reusable decanters used to package line of boiled English sweets and confections. "Americana" collection (l.) offers apothecary-style jars with antique bicycle, automobile, ship, street car, locomotive designs. Colors are screened and fired on separately. Futuristic decanter (r.) has gold colored polystyrene stopper. Neckband is permanently applied gold foil.—Cresca Inc., N. Y. C.

Other products spotted at show (but not pictured) . . .

- Kangaroo tail and sharkskin soup packed in cans under Lacroix label.—Cresca Inc., N. Y. C.
- Coffee cordial-centered confection (called "Demitasse") that's shaped like bean.—Dalt International, Inc., N. Y. C.
- Tea-taster kit holding samples of nine popular flavors.—F. P. Garrettson Co., Baldwin, N. Y.
- Transparent cake glaze in paper envelope.—C. & G. Willenborg, Hoboken, N. J.
- Wine cheese packed in plastic tumblers with colorful rattan lining. — Swiss-American Importing Co., St. Louis.
- Cocktail Zesties, a blend of nuts and cereal wafers.—Roth & Liebmann Inc., N. Y. C.

Carnation's Radically New Fleet of–

Plastic-Body Route Trucks

They're easier to keep cool, simpler to clean, maintain, and repair. And being much lighter than standard metal milk carriers, they save on gas and tires

30 UNUSUAL PLASTIC TYPE retail milk delivery truck bodies are now in regular service for Carnation Co. Each carries a payload running from 55 to 90 cases of milk.

Contributing in this development was the company's experience in operating three trial plastic bodies at its Houston, Tex., plant in 1954-'55.

The new carriers are unusual in that they–

1. Are both integrally insulated and refrigerated.

2. Weigh 500 lb. less than standard metal bodies.

3. Are easier to keep cool.

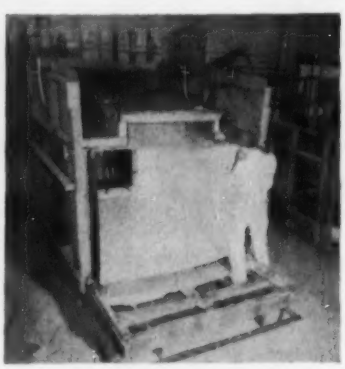
4. Are more sanitary and simpler to clean–no cracks or crevices in which milk or foreign materials can accumulate.

5. Give promise of being cheaper to maintain and repair, since there is no metal to corrode, also no need to replace insulation because the hermetically sealed unit structure is proof against moisture and air.

True, present cost of production models runs a bit higher–10% and 6% over the respective steel and aluminum bodies of the same carrying and refrigerating capacities. However, it's Carnation's experience that the additional first cost has been more than offset by such advantages as lower maintenance and repair expenses. Also, the bodies are expected to be cheaper later on.

As for repairs, the occasional breaks sustained by the glass laminate have been remedied by first cleaning the hole and removing all cloth shreds, then building up plastic in the aperture. After setting and curing, the area is sandpapered to smoothness and finally retouched with the proper paint color.

A further benefit cited is improved gasoline and tire mileage due to less body weight. And there is this specific cooling detail: The body's greater resistance to heat trans-



BODIES ARE BUILT upside down in jigs. First, outside glass laminate shell is set in, next wooden framework is bonded to it and Fiberglas insulation inserted, then inside white glass laminate shell is bonded to frame. Photo shows following stage–bonding of pre-assembled body floor to upper body. Entire body, including cowl, is glass laminate.

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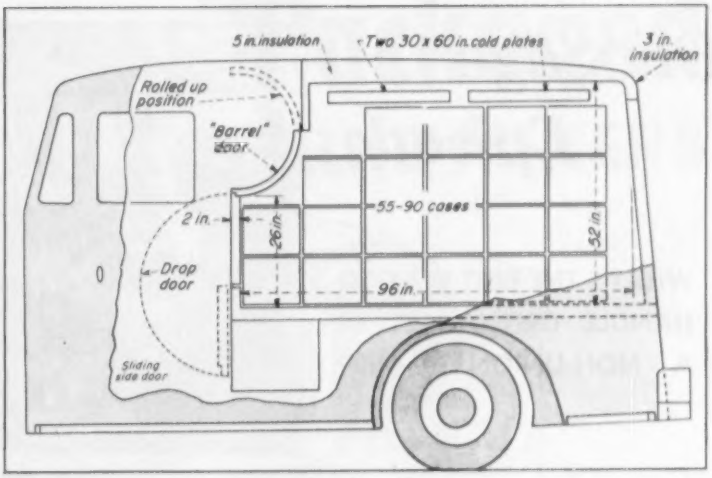
fer enables it to maintain 3-5F. lower temperature. This was verified by tests during the hot months at Houston. When the mercury ran 90-95F. outside, a former body initially precooled to 32-25F. ended up at 45F. after the day's operations. In contrast, end-temperature of the plastic body was 40-42F.

Made by Permoglas, Inc., Santa Ana, Calif., the new bodies are of the glass laminate type. Besides cowl and doors, they consist of two plastic molded shells (one inner and one outer, separated by a wooden frame with insulation) and an inner and outer floor structure, all hermetically sealed into a single molded unit.



CUTAWAY reveals ingenious combination of "barrel" and drop doors, giving driver direct access to goods in refrigerated delivery compartment.

Truss-Like Strength

The wooden frame is of 2 in.-wide stock, and the insulation (Owens-Corning Fiberglas PF 613) is from 3 to 5 in. thick. Wood of the frame is kiln-dried, open-grain Douglas fir, coated with polyester resin to make it impervious to water and dry rot.

The frame is joined with ½-in. galvanized bolts and is permanently bonded to both inner and outer glass laminate shells. This frame provides only part of the body strength—in short, the aforesaid bonding with the shells serves to form a truss-like unit stronger than the frame alone.

Fiberglas cloth and mat, impregnated with polyester resin, form the shell skins. As for hue, a single white color is impregnated in the laminate of the present bodies, the outside lower portions of which are later painted red in accordance with the company color scheme.

After three years, this paint has stood up better than that applied on metal. However, Permoglas is now experimenting with production of two or more impregnated colors.

Design Aspects

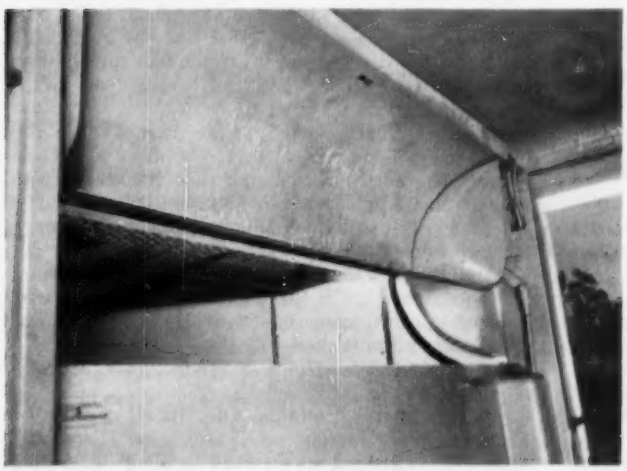
Truck-cab side doors have purposely been made 29 in. wide for front loading. Also unusual is the combination of "barrel" and drop doors in the bulkhead behind the driver's position (instead of hinged or sliding doors).

The barrel door makes for more efficient and easier order filling from the driver's compartment, thus generally reducing driver-labor. Further, it helps conserve refrigeration, since it averts drafts in that compartment.

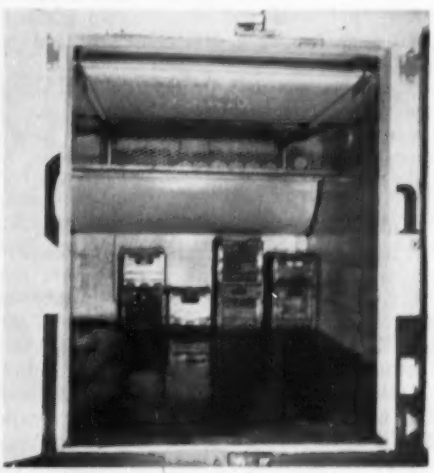
Through the opening, driver can easily see and reach packaged items on the high shelf inside. This door also gives him ready access to heavier products in the compartment. By opening this single door he can reach any stack across the width of the truck.

Designed by Bud Loomis, Metalco Body Works, Los Angeles, in co-operation with Carnation, this barrel door is of plastic and has 2 in. of

(Turn to page 179)



CLOSEUP within cab. Package shelf is seen through partly-open barrel door. Note pneumatic-piston unit (mechanism's housing is seen at lower right) that operates this 'cylinder-section' door.



CAPACIOUS 5-wide milk-case compartments as viewed through rear doors. Barrel door, package shelf, and cold plates are seen above.

Ole Sage Episode

WHAT'S THE BEST WAY TO HANDLE GRIEVANCES IN A NON-UNION PLANT?

"You planning," crackled Batt Bulwark, "on giving away all of management's rights?"

IVAN C. MILLER
Associate Editor, "Food Engineering"

THE RESOUNDING "WHANG-G-G" of Milt Sorenson's winning ringer signaled the end of the horseshoe tournament. And now the Guff & Gripers, gathered in Flagley's Woods for their Fall Outing & Barbecue, were wandering back to the picnic table for chow.

At this moment, Luke Markham showed up and introduced his guest, J. J. Talmerage.

"I know," said Luke, "that shop talk wasn't to be on the schedule at this outing. But Mr. Talmerage, here, was telling me about a special problem of his while we were driving out. And I'd sure like to see you boys take a pitch at it while we're layin' in the food."

"Speaking of pitches," barked Batt Bulwark, works manager at Mull & Mull, "I'm in a fighting mood after that last ringer of Milt's. So I say let's take on Mr. Talmerage's problem." Then turning to the newcomer he grunted, "Always comforting to know someone else has problems, too!"

"Here it is, then," Luke explained as they all sat down. "J. J. owns and runs his own business—a small plant with less than 100 employees and non-union. That right, J. J.?"

J. J. Talmerage, tall, slender, and well along in years, nodded agreement. Then Luke continued: "J. J. tells me his plant hasn't got a real setup for handling grievances—no truly organized communications. So he seldom hears of specific employee complaints.

Luke paused for a savoring sniff as the cook served the barbecue, then went on: "But J. J. knows questions do naturally arise—and when they're not settled satisfactorily, production can lag and quality suffer. And I'll comment here that most of us G & G'ers have had our share of hassles with workers, but nevertheless know that unions do act fast in spotting dissension."

Talmerage now cut in. "I'd like to go on record that I'm not anti-union. It's this way: If my people felt they'd be better off with a union, I'd not oppose them. Anyhow, I just feel certain that their not preferring a union means they consider that they're treated fairly."

He hesitated a moment, in obvious embarrassment. "Well," he finally said, "I'll give it to you straight: For many years our relationship's been a family-type affair. So until I'm through—and that won't be so very long now—I'd like to avoid dealing with outsiders."

"Has something happened at your place recently?" queried Ole Sage. "I mean, has there been some particular incident to alarm you?"

"No, no," replied Talmerage. "It's just that I'm more and more aware of how our old-timers are slowly dropping away and being replaced by younger people. Then, too, we're expanding, though very slowly. And meanwhile, conditions generally are changing—and not so slowly. It all makes me realize I'm no longer in touch with everyone in our organization—in fact, almost no one anymore."

Ole reflected as he stirred his coffee. "When touchy personnel situations arise in a plant, but don't 'get through' to management and so just go on rankling, then it's a good bet that morale will take a dive and output suffer. Of course, grievance reporting in union plants is usually very fast. The question here is how to get equally rapid communications for all needs, including grievances, in a non-union operation. And then how to properly handle, and dispose of, difficulties."

"I suppose," mused Batt, "that first you gotta work out a way to catch the gossip, gripes, and rumors—that is, keep an ear to the ground. But beyond that, isn't it all the same? With or without a union?"

"I disagree," interjected Milt Sorenson. "When employees are union-represented, the contract almost invariably has a step-by-step grievance procedure, with usually some type of third-party arbitration in event of a deadlock. But in a non-union establishment, management is always the arbitrator."

"And that," solemnly pronounced Personnel Manager Tom Watson, "is the crux of the problem. In a non-union plant, management is law maker, police, prosecuting attorney, and judge."

"Then management in a non-union place is always on a tight rope," chuckled Batt.

"Not necessarily," retorted Ole, "It all depends on management's planning and its sincerity. However, I agree that management in such a plant makes the laws—or, what is too often the case, fails to make them.

"In the latter event, most everyone in the shop who has a say makes his own laws and enforces them in his own way, and the result is chaos. But law or no law,

today's TREND is toward

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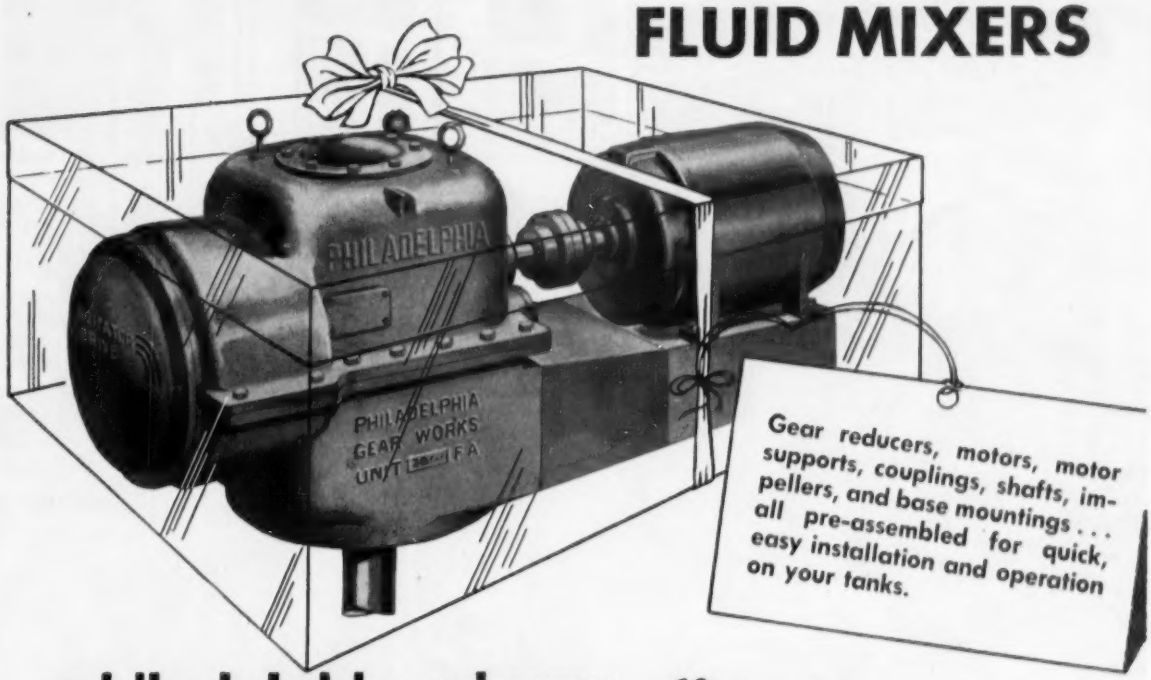

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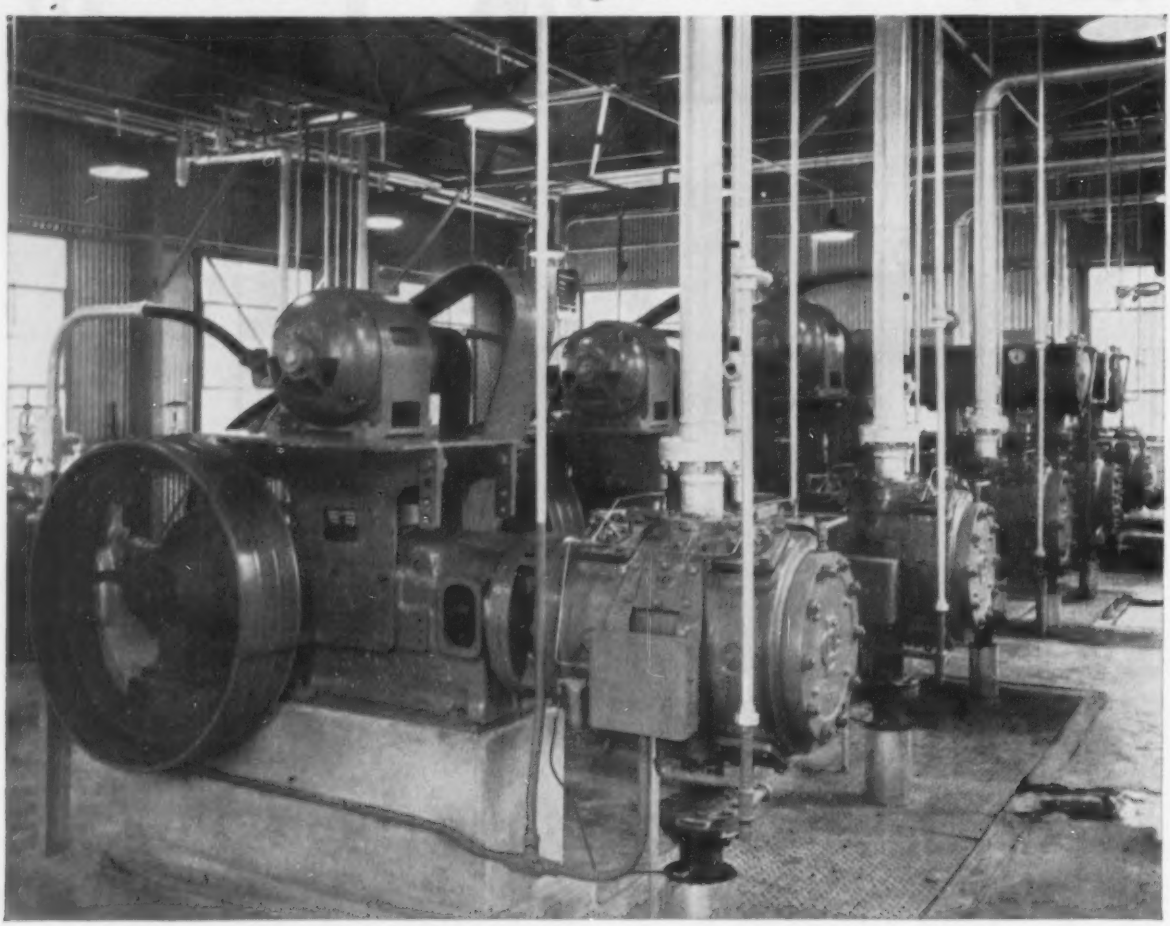

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the management must police and prosecute and judge."

Talmerage seemed perplexed. "You mean I'm worse off than I feared?" he queried.

"Not at all," Ole assured him, "Let's start here at the real beginning—which is even before the rule-making stage. In short, management's *attitude* comes first. Always, management should *want* to be fair—especially in a non-union shop—and *try* to be fair even to a lean-over-backward extent."

Here, Tom broke in: "Whatever the program and procedure, management must convince employees of its sincerity, otherwise all is wasted."

"That hits the nail smack on the head," declared Luke. "But how do you go about building—and holding—that confidence once you have it?"

"On that score," said Ole, "let's consider the four responsible steps that management of a non-union shop should undertake: First, in every organization, and non-union ones particularly, management should establish a policy that is fair to personnel and equitable in grievance handling. And it should be thoroughly explained to all employees as well as to all levels of management. Furthermore, the policy should be periodically recommunicated, preferably in writing."

"There's no doubt," commented Milt, "that company policy should establish grievance procedure, the same as a union contract does."

"Swell for management," burst out Batt, "but what about the poor, aggrieved worker with no union to fight his battles? If he bucks management, he may be fired—at best, he's 'in dutch'."

All eyed Batt in astonishment, with Milt exclaiming: "First time I ever knew you to be on labor's side."

"Don't worry, I'm not." chided Batt. "It's just that I like to argue, especially when I spot a soft place in someone's armor."

"That brings us to policing—the second responsibility of management," announced Ole.

"That's the foreman's job," cried Batt.

"But not limited to foreman," came back Ole. "In fact, policing is the job of every member of management. And in industrial relations, just as in civil affairs, the police officer has the dual responsibility of enforcing regulations and guarding and protecting. Serving as policeman, the foreman, or anyone else in management, must do it. It's the foreman, however, to whom the aggrieved should come for satisfaction."

"Yeah, give it a religious twist, Ole," belittled Batt. "A foreman must be defender of the right and foe of all evil."

"Funny," laughed Tom. "Batt is usually right just when he doesn't want to be."

Arising from his seat, Batt eased his back against the nearest tree. Then he disdainfully snapped: "How muddled can you get? Just to take an example, suppose a foreman docks a worker, lays him off, or fires him. So then the worker's aggrieved, and he says to the foreman: 'Boss, you ain't treatin' me fair—and I want you to defend me!' "

"Batt," cut in Milt, "you've brought us to the third step—the trial. Now we have to figure out who prosecutes and who defends. When we've covered that, the muddle should disappear. And here's my suggestion: Why not let the workers pick representatives to handle their grievances, just as union stewards are picked?

"To be selected like that, in an unorganized place, is to be condemned," Batt chided. "Heaven protect the poor guy!"

AT THE GUFF & GRIPERS' Fall outing, Milt's triumphant horseshoe toss puts Batt into a mood—a fighting mood for tackling the plant personnel problem that's made old Talmerage so uneasy.

"Actually," defended Tom, "the idea has proved out in several plants, with company policy fully protecting the representative." Then he grinned. "There was just one trouble. Whenever a rep did a really good job, management wanted to make him a foreman."

"When there's an employee-management safety committee functioning," contributed Milt, "that group can usually handle grievances to the satisfaction of all."

"Yes, and I'm intrigued by recent experiments with labor-management committees," said Tom. "When properly set up, they seem to handle many problems Okay. So it seems to me that some-such group, reporting to the president as need be, could do the trick."

"You planning on giving away *all* of management's rights?" crackled Batt.

"The right to manage," put in Ole, "needn't be sacrificed here. For in the end, isn't management the arbitrator and judge?"

"Well, I just don't trust committees," mumbled Batt. "Mostly, they get you crossed up."

"That shouldn't happen unless management seriously errs," Ole emphasized. "Because it should be established beyond question, with workers and management alike, that nothing in the procedures should in any way usurp management's rights or curb line management."

"And there's something," said Milt, "I'd particularly like to plug for: Whatever the program, the full dope on it should be included in the training given supervisors."

"Right you are, Milt," agreed Ole. "And it still seems to me that the foreman should be the first one to hear the complaints of his people. Yes, even when it's something relative to his own decisions or actions."

At this, Batt whistled sarcastically. But it was obvious that Tom and Milt were in agreement with Ole.

"What a tribute it is to a foreman" Ole concluded, "when his non-union employees feel secure in appealing to him for justice and understanding."

Before the meeting broke up, Talmerage expressed his gratitude to the members and added: "I'll start at once to put the suggestions you've made into effect. And I intend trying to keep our people happy so they won't want to organize while I'm still in the saddle." Then, after a moment's pause, he continued wistfully: "Wish I knew how to handle the situation if ever a union organizer should start to work on my people."

"That gives me an idea," said Barney Hasbrook. "A fellow I know—an officer of Barnastian Bros. Bakery—says a union organizer has just gone to work at his place. So how about me bringing my friend along next meeting? We could have a go-around on 'How to Handle an Attempt to Organize,' and he'd surely contribute."

"Grand idea," said Luke. And the other G&G'ers nodded as they climbed into their cars.

FE OPINION

FRANK K. LAWLER, Editor

We Practice the Progress That We Preach

That our publication is dedicated to progress in the food industry is well known. And that our staff is equally dedicated to top performance in its own work is no secret to our many long-time readers.

New evidence of the latter appears in this issue of FE. We have streamlined the make-up and typography of our editorial pages to further enhance readability for your convenience. Yet we have not robbed you of information by wasting space on a large acreage of meaningless display. We know that you still want facts to help you on your job.

Our articles continue to present enough information to save your valuable and scarce time. They tell you enough so that you may evaluate the advances discussed in terms of what you can do with them in your operations. You don't have to go elsewhere to find out what it is all about.

Our information also is presented for three-speed reading—again for your convenience. You get the big ideas at a glance, the story in a nutshell in a few seconds, and additional but concise detail as you like it. And we are perforating some pages for easy tear-out and filing.

We also give you a well-balanced diet that includes articles on the various phases of food manufacturing and processing.

With this October issue, we are fittingly celebrating the 42nd anniversary of ABC—Audit Bureau of Circulations. For ABC is synonymous with service to readers. In short, it stands for magazines edited by the editors for readers who pay.

It is through payment that readers keep editorial policy and performance responsive to their needs. To make a magazine sufficiently valuable that it will command a price in a field where free publications are available keeps the editors on their toes. We like it that way. You benefit that way.

And you may be sure that we will continually keep pace with your requirements so that you will continue to buy our product.

We believe in practicing the kind of progress that we preach to our industry. We would even consider automation, but no genius has yet come up with a robot editor.

And editors operated by the pull of strings we wouldn't have.

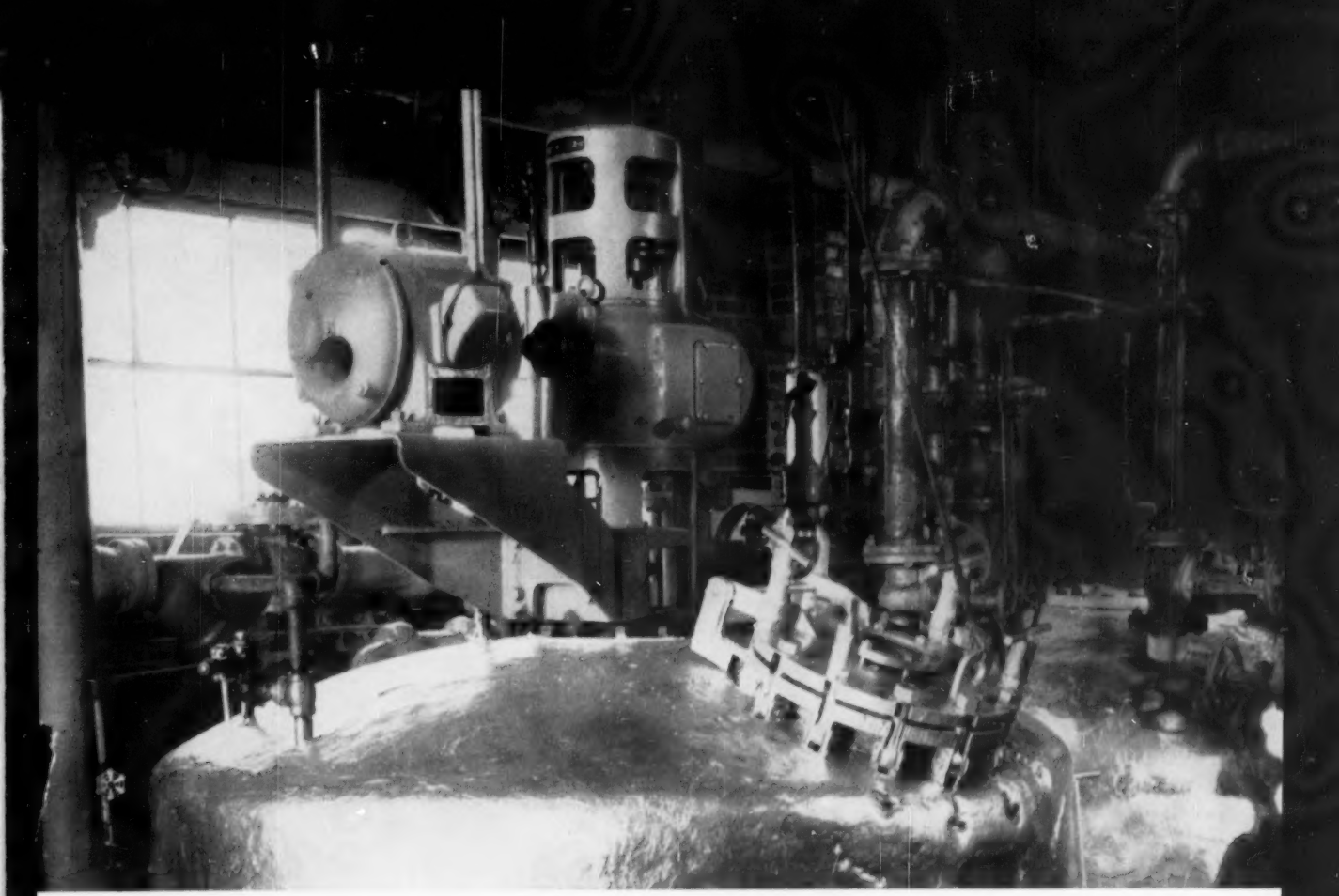
How High Is Your Serendipity Rating?

You may recall the tale of the Three Princes of Serendip who were always discovering things they did not seek.

To be able to recognize a valuable find when your eye is on a different goal is to be blessed with the secret of some of the world's greatest scientific achievements.

But you don't have to be a Ph.D in a lab to capitalize on serendipity. You probably have heard how a little baker pulled underdone rolls from his oven before going to a fire with his volunteer brigade. And being blessed with serendipity, he recognized that he had a valuable new product.

So sift the accidentals and incidentals through your brain before discarding them. You, too, may find gold.



How to keep **25,000 lbs. of product** *from burning up*

How can you assure even cooking, without burning, in batches as big as 25,000 lbs.? Here's how one company does it with a LIGHTNIN Mixer:

Sethness Products Co., Chicago, makes high-quality caramel from sugar, in the big pressure kettle you see here. The sugar must be stirred constantly, while temperature rises and holds steady above 250°F for several hours, then quickly drops to 200°F. Good temperature control is vital.

What the mixer does

To meet the critical stirring requirements, Sethness uses a Series "E" LIGHTNIN Mixer with stainless shaft and turbines. The mixer creates a rapid, uniform flow of sugar throughout the kettle. It keeps temperature equalized, so sugar caramelizes uniformly. And it provides high coefficient of heat transfer, so temperature changes in the vessel jacket are transmitted quickly and evenly through the batch.

You can meet the most exacting fluid mixing requirements—in any batch size, any tank or container—with LIGHTNIN Mixers. You get the *one* correct mixing pattern that exactly meets your needs—selected scientifically from many hundreds of standard power-speed combinations. Results are guaranteed, unconditionally.

Lower mixing costs

You save on installation and maintenance, too. Every LIGHTNIN Mixer comes to you assembled and aligned, ready to operate. Most models are easily converted to meet process changes, as they occur. Hundreds of LIGHTNINs have been in service 20 years and more.

For quick, competent help on mixing that does what you want it to do, call in your LIGHTNIN Mixer representative today. Or write us direct.

Lightnin® Mixers

MIXCO fluid mixing specialists

MAKE ANY OPEN TANK an efficient mixing vessel, by adding a LIGHTNIN Portable Mixer. Thirty models; wide choice of motors and materials to match your conditions.

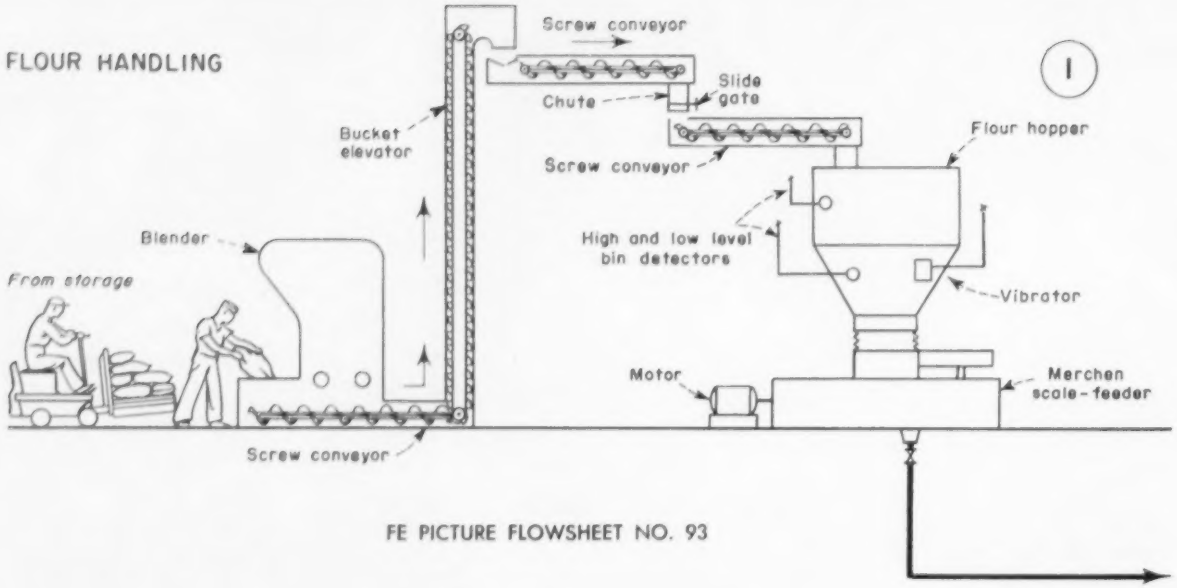
FOR LATEST MIXING INFORMATION and full description of LIGHTNIN Mixers, send for these helpful bulletins:

- ☐ B-102 Top or bottom entering; turbine, paddle, and propeller types: 1 to 500 HP
- ☐ B-103 Top entering; propeller types: ¼ to 3 HP
- ☐ B-108 Portable: ⅓ to 3 HP
- ☐ B-104 Side entering: 1 to 25 HP
- ☐ B-112 Laboratory and small-batch production types
- ☐ B-109 Condensed catalog showing all types
- ☐ B-111 Quick-change rotary mechanical seals for pressure and vacuum mixing
- ☐ B-107 Data sheet for figuring mixer requirements

Check, clip, and mail with your name, title, company address to:

MIXING EQUIPMENT Co., Inc. 143-k Mt. Read Blvd., Rochester 11, N. Y.

In Canada: Greey Mixing Equipment, Ltd., Toronto 10, Ont.



Flour to Fermented Dough in 2 Min.

Continuous process is radical departure from conventional methods

CONTINUOUS, AUTOMATIC dough mixing has reached a pinnacle at Purity Baking Co.'s Decatur, Ill., bread bakery. And the accompanying flowsheet shows how it has been skillfully engineered into the bread line for dynamic "in stream" production-control of uniform, finer textured loaves. Process is a development of Baker Process Co., Belleville, N. J.

Here's how it fits into bread-baking operations at Purity:

Flour is conveyed into a conical-shaped hopper—Point (1) in flowsheet. Equipped with high-and low-level bin detectors and Syntron vibrators, this hopper supplies a gravimetric Merchen scale-feeder. This unit proportions flour for gravity feed into a vibrating sifter and then into the dough pre-mixer—seen at Point (7).

A parallel operation is preparation of the ferment broth—Point (2). Water (84 F.) is metered into seven partially jacketed 100 gal. stainless tanks equipped with temperature-controller indicator and vertical, propeller-type agitators. Then scaled into each fermenting tank are such other ingredients as yeast, yeast food, milk solids, salt, sugar, and enrichment tablets.

For story of how advanced food engineering made this efficient, close-tolerance process possible, see article on page 74.

Broth (765 lb.) is next pumped into a 100-gal. holding tank—Point (3)—then is gravity fed into a small constant-level tank. From this tank a controlled amount is pumped through plate-type heat-exchanger—Point (6)—into pre-mixer. Before flowing into pre-mixer, it receives oxidant solution that is pumped from a 100-gal. tank—Point (4).

Shortening is melted to 140F. in 500-lb. stainless tank with agitator and temperature controller—Point (5). Pump then carries it through electrically heated, thermally wired pipe into a 150-lb holding tank. And another pump transfers pre-set amount into pre-mixer.

Continuous Dough Mixing

Ingredients are given a 30-sec. blending in pre-mixer. Unit's pair of horizontal agitators move ingredients forward and out of the chamber. A built-in pump delivers dough through a 3-in. stainless pipe into developer—Point (8). Here, dough mixing is completed by a pair of vertical, counter-rotating impellers. Worked to proper characteristics in 90 sec., the plastic dough is extruded through the divider, which cuts off loaf-size pieces. These drop into greased pans traveling on pan-positioning conveyor.

Control panel—Point (9)—permits pre-setting of feed rates of broth, oxidant, melted shortening, and dough pumps, as well as flour delivery. Panel-installed meters show performance of these pumps, and quick adjustments can be made.

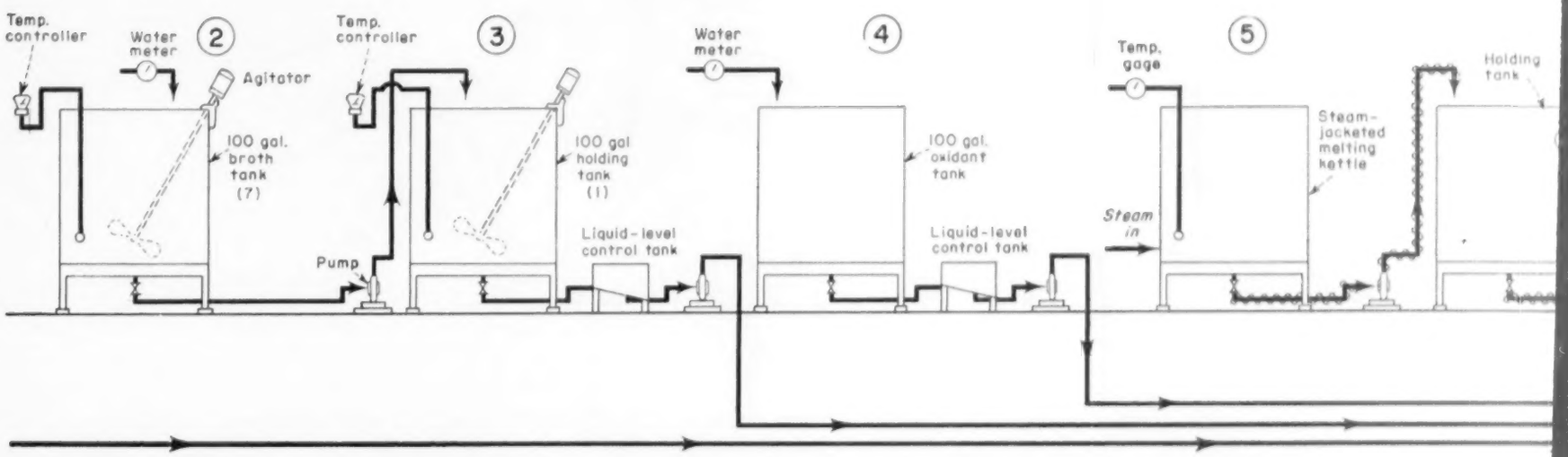
Continuous dough process stops at this point. Operations from here on are typical of those found in modern bread bakeries.

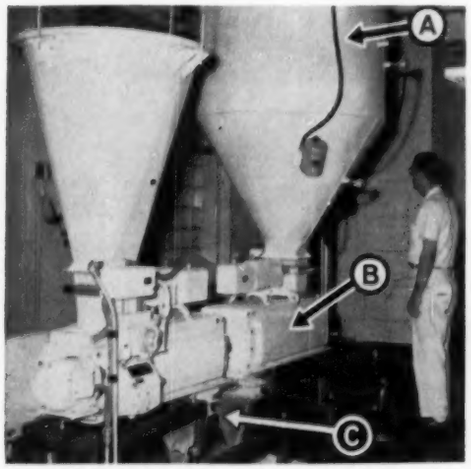
UNFOLD HERE

PREPARING BROTH

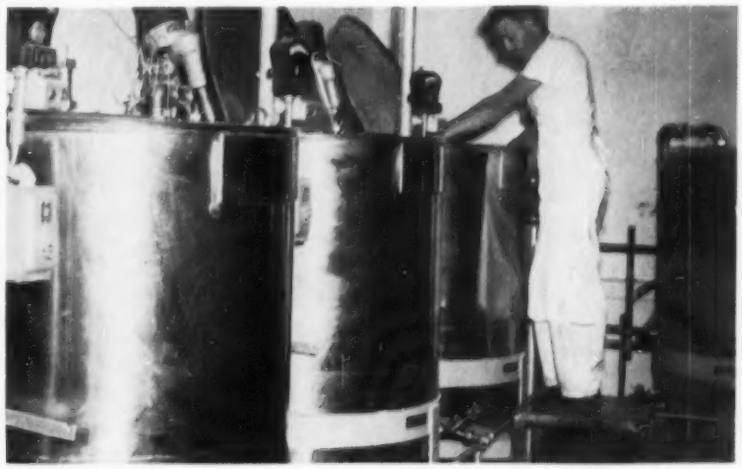
OXIDANT MAKE-UP

MELTING SHORTENING





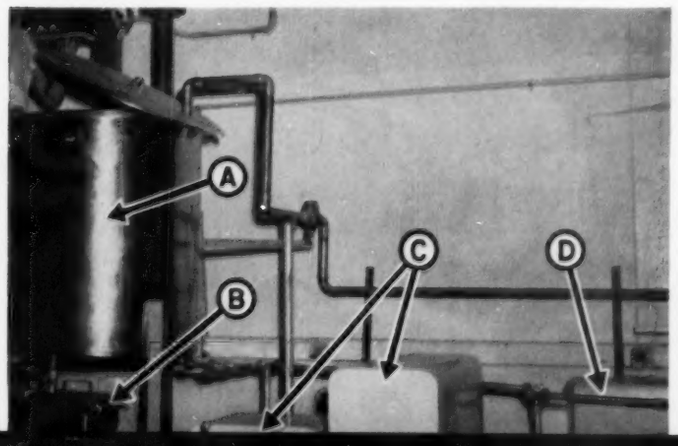
1 **FED INTO** hopper (A) from blender by series of conveyors, flour is continuously proportioned by scale-feeder (B) and discharged (C) for delivery through sifter and pre-mixer.



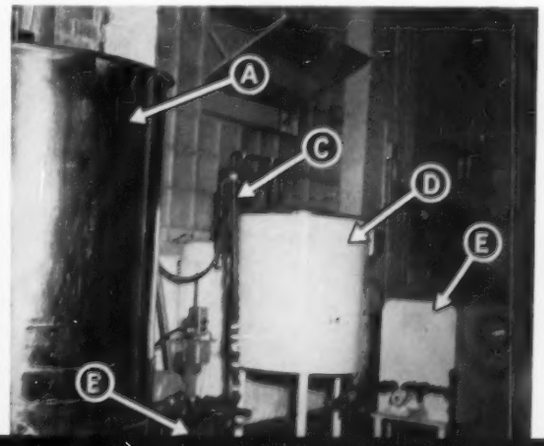
2 **LIQUID BROTH** is made up in 2½ hr. in stainless steel fermenting tanks. Temperature controllers keep fermenting broth from exceeding 89F., and agitators speed uniform solution of dry ingredients. Preparation of broth enables bakers to side-step sponge-making and fermenting operations.

3 **HOLDING TANK** (100-gal.) is constantly pump-filled with broth from each of the seven fermenting vats by a single sanitary pump. Agitator-type tank is also temperature-controlled.

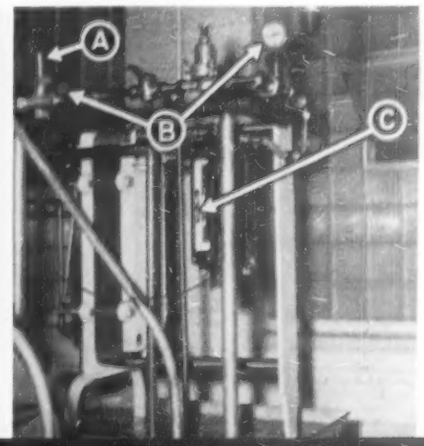
4 **OXIDANT** is made up in 100-gal tank (A). Solution of potassium bromate and iodate is gravity fed into liquid level-control tank (B), from which it is pumped to dough pre-mixer. Note oxidant and broth pumps (C) and broth control tank (D).



5 **SHORTENING** is melted in 500-lb. temperature-controlled tank (A). Pump (B) then carries it through electrically heated pipeline (C) into 150-lb., temperature-controlled holding tank (D). Hot shortening (140F.) is then fed by second pump (E) to dough pre-mixer.



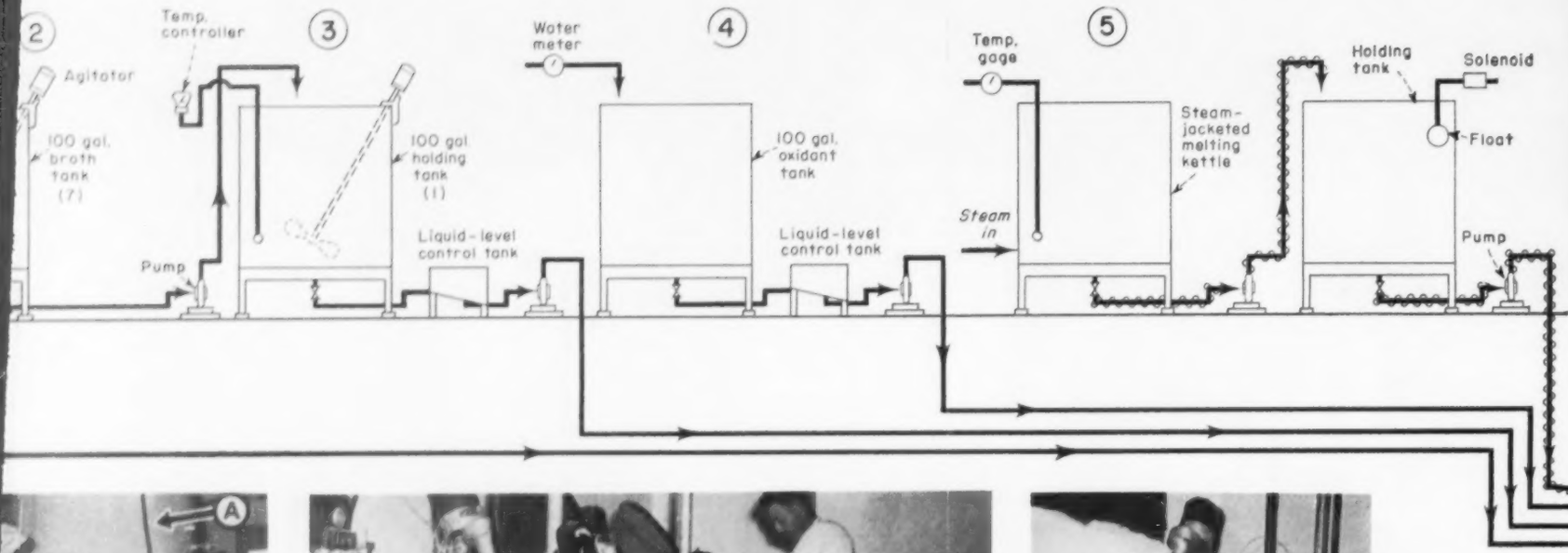
6 **BEFORE** entering pre-mixer, liquid broth is pumped through plate-type heat exchanger. Note pressure controller (A), pressure and temperature gages (B), and Rotameter (C).



REPARING BROTH

OXIDANT MAKE-UP

MELTING SHORTENING



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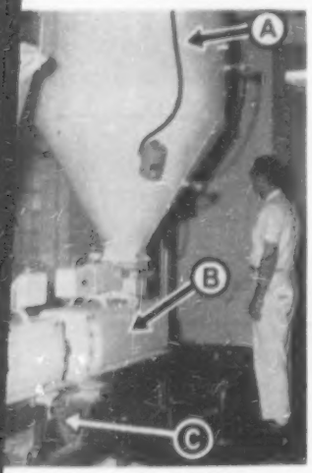

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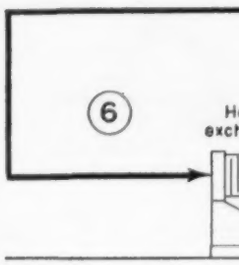

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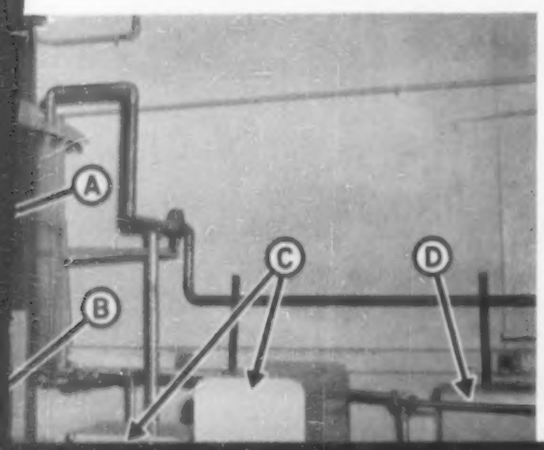
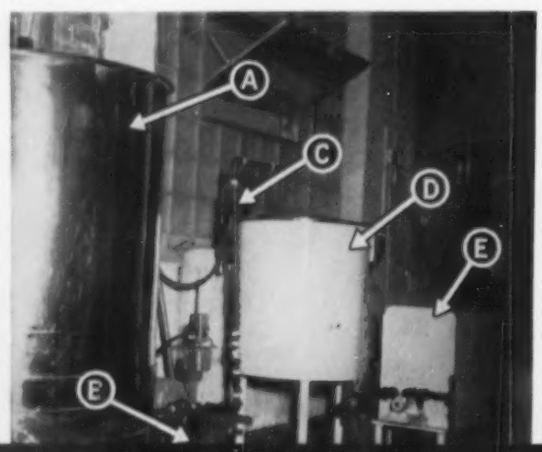
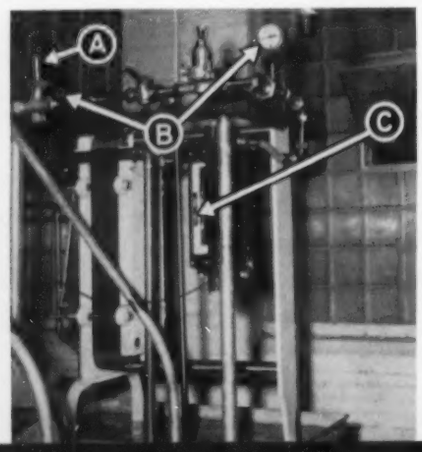
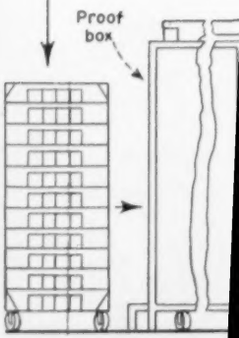
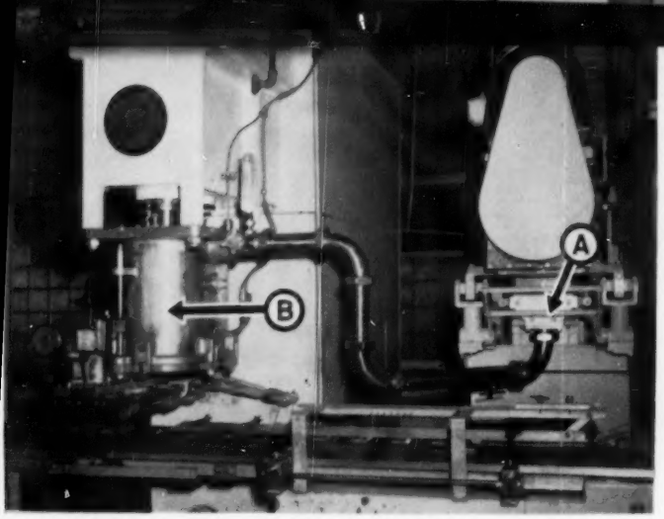


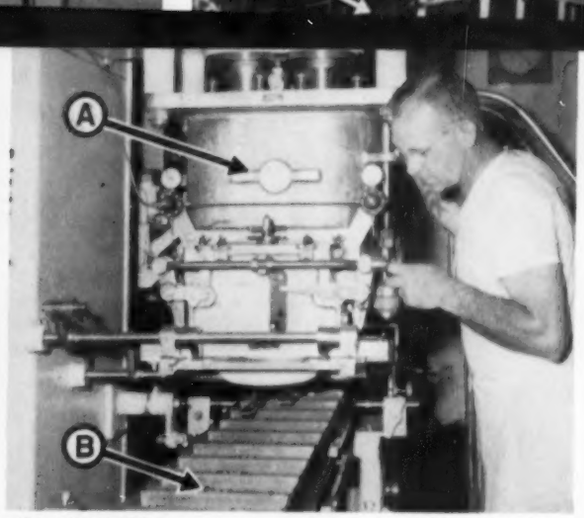




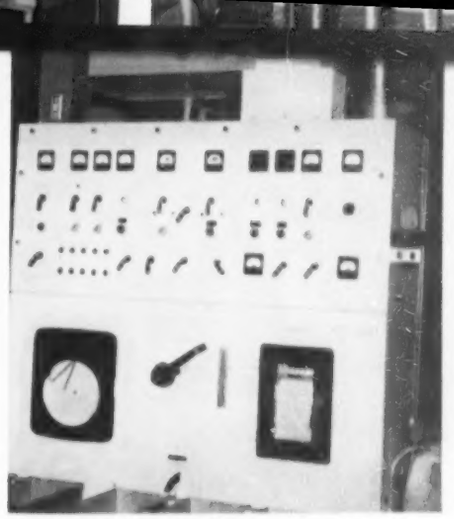




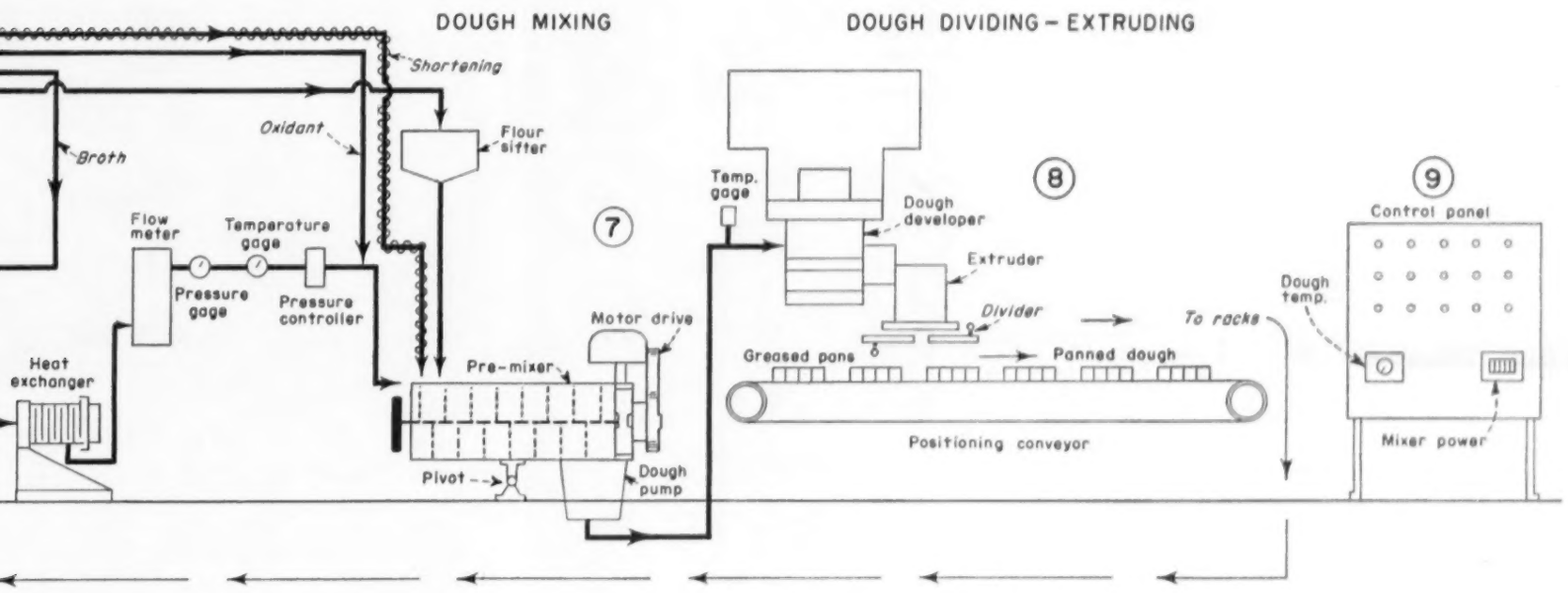
7 **DOUGH** from pre-mixer is carried by pump (A) through 3-in. dia. pipe into dough developer (B). Pre-mixing of dough takes only 30 sec., and mixing is completed in 90 sec. in developer.

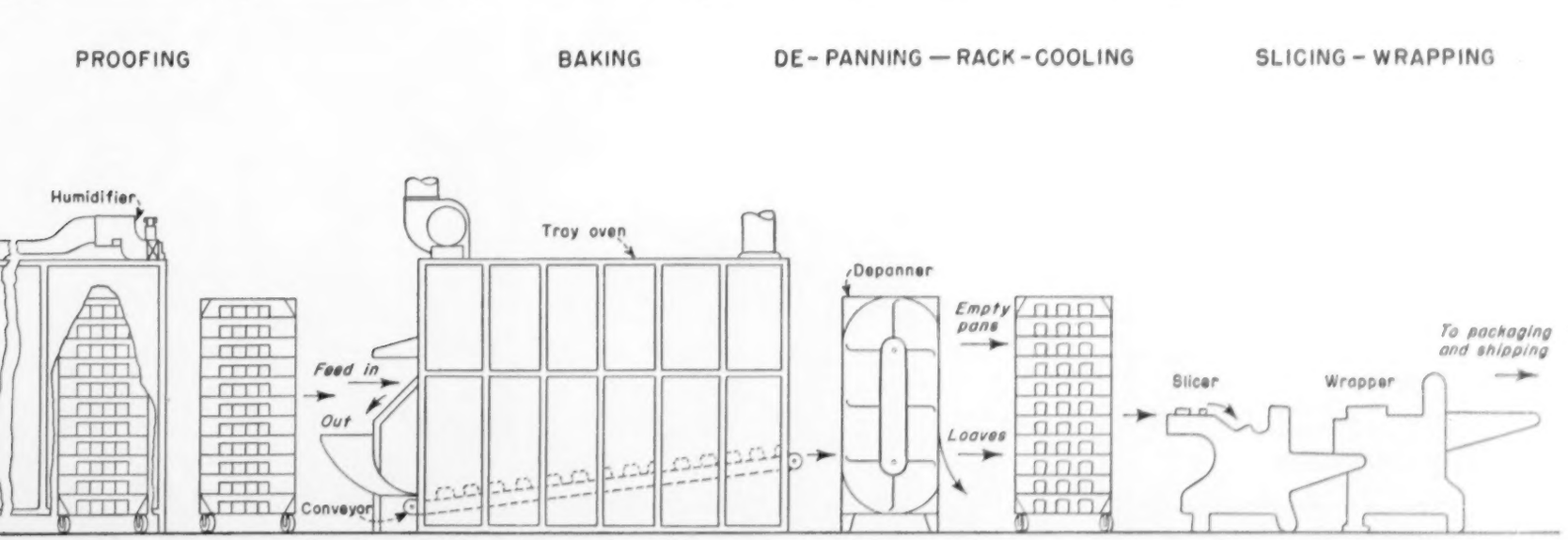


8 **OPERATING** speeds of dough developer-divider (A) and pan positioner (B) are synchronized from control panel for precise depositing of dough into pans.



9 **AMOUNT** of ingredients pump-fed to pre-mixer, also operation of dough pump, are controlled at this panel.





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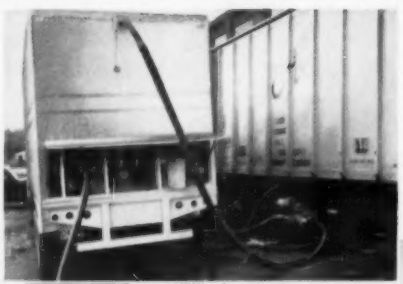
The Airslide transfer unit is a unique combination of the F-H Airslide air-activated gravity conveyor and Airveyor® pressure type conveying system, wherein the flour is ideally fluidized by the Airslide for charging into the conveying system by the blow-through type of feeder.

For more complete information, write for Bulletin TU-1. It will be sent you promptly.



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7 years' trouble-free service on HCL acid with this Crane diaphragm valve

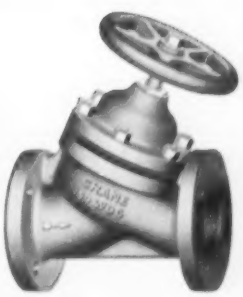
How do Crane diaphragm valves perform on acid services?

This major container manufacturer has impressive proof. Seven years ago, the Crane 4-inch No. 1615-RN rubber-lined diaphragm valve shown above was installed on 17 deg. Baume hydrochloric acid service. The acid is used to clean evaporators and surface condensers. *Not once has this Crane diaphragm valve failed to function—not once has it failed to hold tight.*

Previously, this plant used conventional all-metal valves. These had to be replaced regularly as an expendable material. The Crane valve has eliminated all replacement costs by providing maintenance-free performance—and from all appearances will continue to do so for years to come.

You just don't get service like this from ordinary valves. Crane valves are so expertly designed, have such quality materials and are so carefully machined and tested that cost-free records like this are the rule rather than the exception with Crane users.

Get the facts on Crane diaphragm valves from your local Crane Representative, or write to address below.



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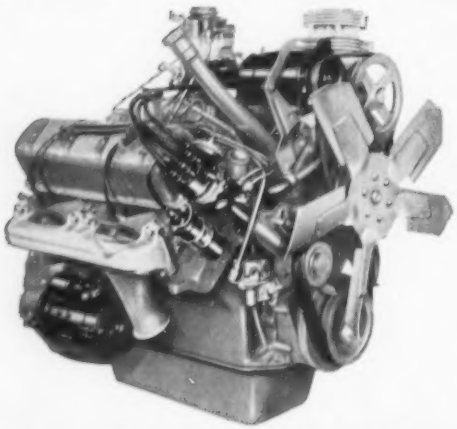
New Heavy-Duty V-8's—206, 226 and 257 hp.



Power to Pull . . . Power to Roll

In traffic and out on the road, new INTERNATIONAL V-Line trucks get loads moving *fast*, keep them moving. They are powered by new heavy-duty V-8's with the most GO under any truck hood. You get economical operation, top performance. You haul big, profitable loads.

Only INTERNATIONAL short stroke, Y-block V-8's have all these long-lasting, cost-cutting features—"wet" replaceable exhaust valve guides, positive type valve rotators, exhaust valve faces and seats of Stellite, neoprene intake valve shields, sodium filled exhaust valves (V-549). Plus many new lightweight features that reduce costs and increase payloads.

With new V-Line design, you get rugged construction that will stand up under all over-the-road operations. There's lots of roomy comfort in the sturdy Comfo-Vision cabs, too. Why not drive one today? Stop in at your nearby INTERNATIONAL Dealer or Branch.

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Flavors blend better with

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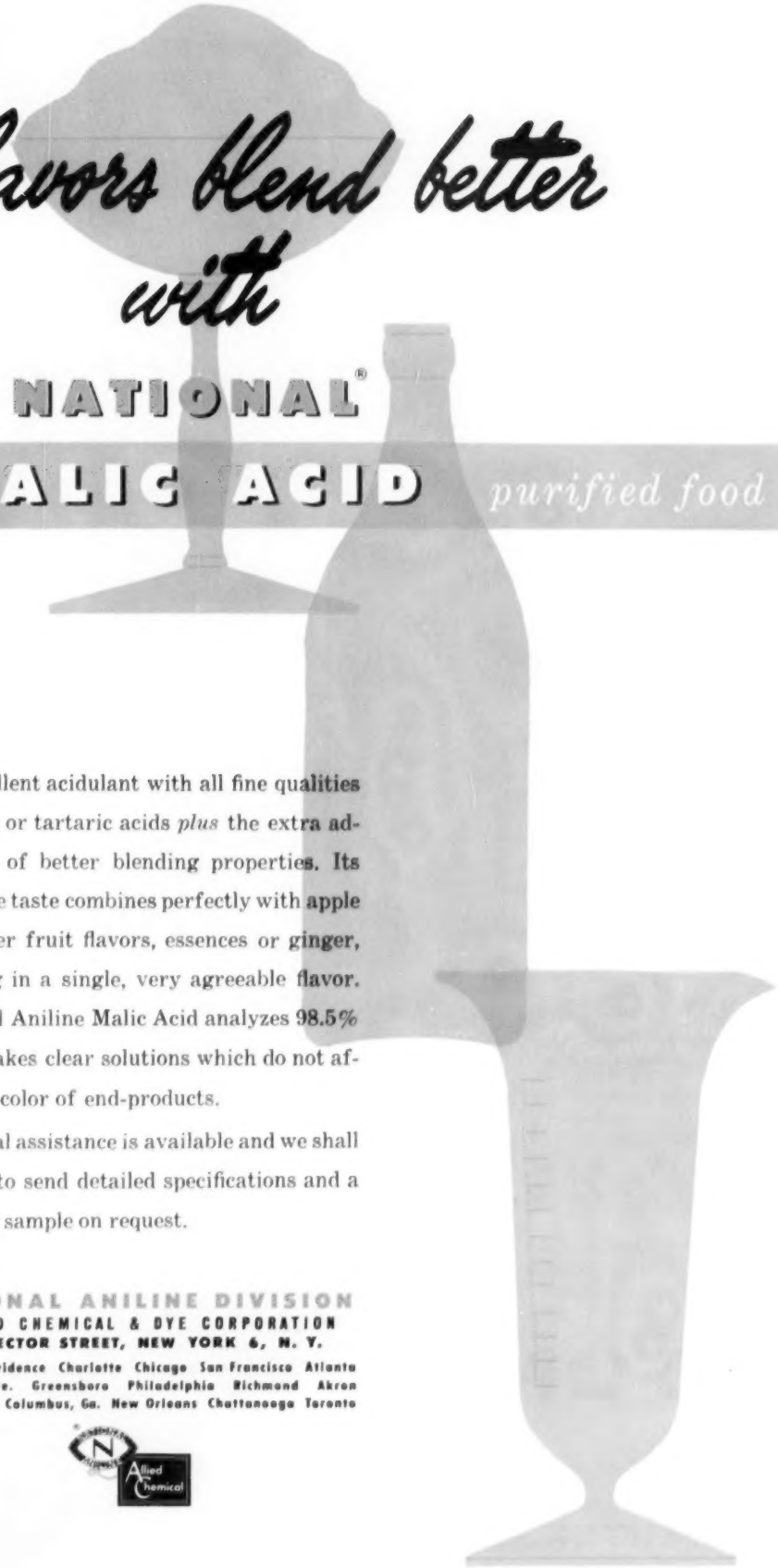

An excellent acidulant with all fine qualities of citric or tartaric acids *plus* the extra advantage of better blending properties. Its palatable taste combines perfectly with apple and other fruit flavors, essences or ginger, blending in a single, very agreeable flavor. National Aniline Malic Acid analyzes 98.5% pure, makes clear solutions which do not affect the color of end-products.

Technical assistance is available and we shall be glad to send detailed specifications and a working sample on request.

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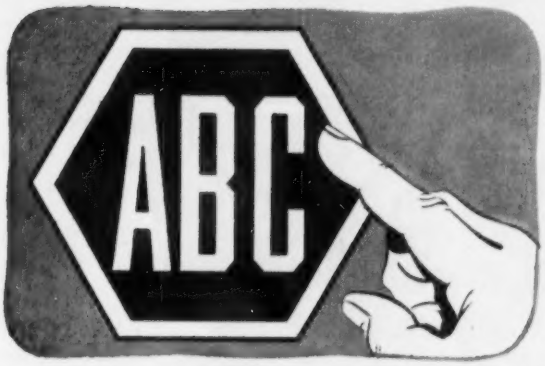

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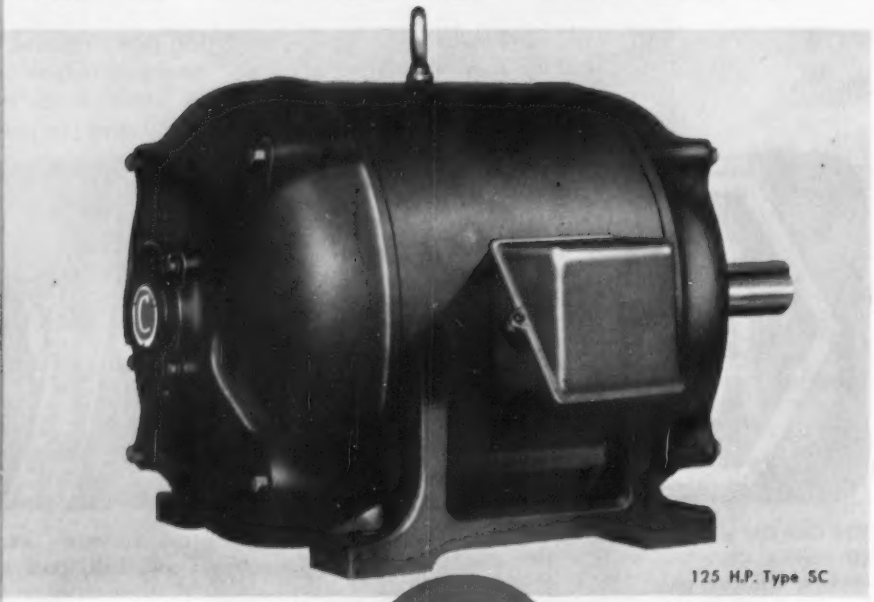

125 H.P. Type SC

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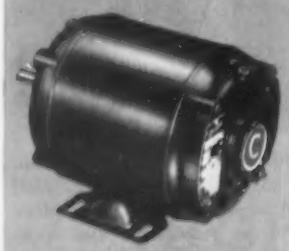

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TEAR OUT AND FILE

NEW EQUIPMENT & SUPPLIES

New Falling-Film Evaporator Has Broad Application

Employing a new wiper design for controlled turbulence and uniform film thickness, this falling-film evaporator offers increased operating efficiency and economy in a variety of applications—concentration of fruit juices, isolation of aromatics, and evaporation of high-boiling liquids such as fatty acids.

Moreover, when used in the molecular range, it permits efficient recovery of vitamins from natural triglycerides, purification of monoglycerides, and isolation of natural oil components.

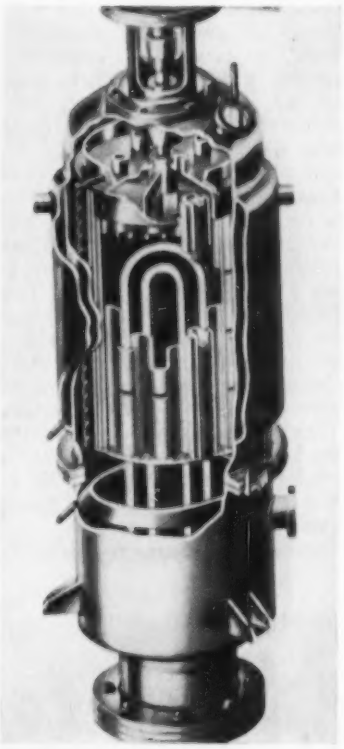
In this design, heated walls of the still are contacted by wipers (see cutaway) made of impervious graphite or other suitable materials. Individual units are set at an angle to direct flow downward as well as circumferentially. They are held in a special retainer which permits free radial motion, and are kept in contact with the walls by centrifugal force.

Wipers are made in short sections and may be replaced without disassembling the entire still. No compensation for variations in radius, or internal machining, are necessary. Relation of centrifugal force to rotor speed provides a direct means of controlling turbulence.

Advantages cited for the new evaporator include—

1. **Improved heat transfer:** Turbulence-promoting wipers permit high heat-transfer rates, even with highly viscous products.
2. **Short contact time:** Heat-sensitive materials may be processed without deterioration.
3. **Constant uniform film:** Continuous wiping of walls controls film thickness, prevents fouling and solids build-up.
4. **Economical operation:** Short contact time, high heat-transfer rate, and low power consumption cut processing costs.
5. **Space saving:** An internal condenser built into the still eliminates need for an external unit and interconnecting piping. Compact construction permits high productivity per unit of floor space.
6. **Low maintenance:** Slow wiper speed minimizes wear. Carbon used for the blades is nearly as hard as the alloy of the shell. Hence in normal service, wipers need not be replaced more than once a year.

Evaporator has a heating jacket designed for 115 psi., and temperatures up to 650F. may be obtained with Dowtherm. Any entrained liquid is carried by the vapor to a built-in separator which is integral with the rotor. Droplets coalesce and are returned to the heated surface by centrifugal force.



Maker offers this wiped-film unit in a 2-in. glass model, and in the following diameters of stainless steel: 12, 24, 36, 48, and 60 in. In addition, it is available in other workable alloys.—*Plaudler Co.*, 1018 West Ave., *Rochester, N. Y.*

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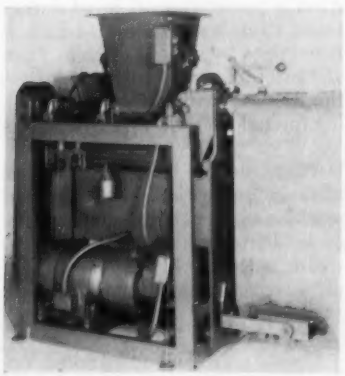

Automated Bag Packer Offers Precise Filling

Automation principles applied to this bag packer are said to boost production and provide precise volume control.

Known as Model 1-5-V, it is equipped with a special feeder system (Micro-Metric) that automatically controls the filling cycle. Capacity is 300-350 lb. per min. on an average free-flowing powdered material (bulk density 45 lb. per cu. ft.) in normal operation. The feeder system applies to valve bags, open-mouth bags, and drums.

In operation, a multiwall valve bag is put on the spout and a filling screw starts as operator pushes a button. A red signal light comes on, indicating that unit is operating, and stays on until the packer shuts off automatically. A 5-hp. motor turns

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the screw at 1,500 rpm. until the bag is filled to about 92% of weight.

As bag is being filled, a hydraulic shock cushioner steadies the scale beam and weighing mechanism. Then a mechanical anticipator, coupled with a Microswitch, shuts off the motor at the 92% point. When this occurs, screw speed drops from 1,500 to 128 rpm., as a smaller motor takes over through means of a magnetic clutch. A potentiometer in the control box permits operator to select the speed of clutch action.

With screw speed at 128 rpm., bag is filled to pre-set weight. This permits the scale beam to function slowly and accurately. When final weight is reached, the screw stops instantly and reverses itself to remove all material from the spout. Thus, no excess powder falls into the bag or onto the floor as bag is removed from the packer.—*H. L. Stoker Co., P. O. Box 112, Claremont, Calif.*

Circle 109B on Reader Service Card

Automatic Dispenser Ups Labeling Efficiency

Handling multiple rows of pressure-sensitive labels, this automatic dispenser is said to speed application as much as 400% over manual methods. From 2-10 labels can be dispensed at once, depending on size.

Speed of the unit (Multimatic Model 5) is determined by operator's need for labels. Once turned on, it supplies a single row and stops. When the last exposed label is removed, machine turns itself on and dispenses another row, then stops again. A multiple-width roll as wide as 5¾ in. has 1,000-10,000 labels.

Unit measures 9¼x12x6½ in. and weighs 9¾ lb.—*Archer Label Co., 783 Kohler St., Los Angeles 21.*

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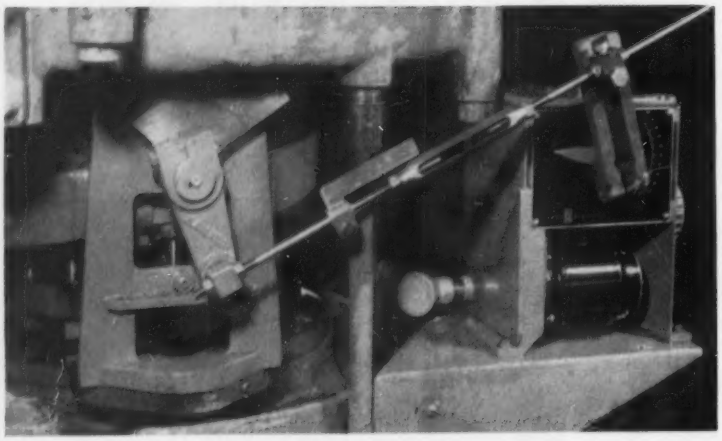

Continuous Fill Control Cuts Product Giveaway

Costly overfill of liquids may now be minimized by a unit that automatically compensates for product-temperature change during filling. Tests indicate that overfill can be held to 0.1 oz. per qt.

Net volume delivered is regulated by a temperature-sensing bulb in the filler bowl that actuates a drive motor. Latter is connected to the volume adjuster. Thus, fill is continuously corrected according to the predetermined temperature-density relationship of a particular liquid.

Available for nearly all types of fillers, the device reportedly requires little maintenance.—*Crown Cork & Seal Co., Erie Ave. & "H" St., Philadelphia 34.*

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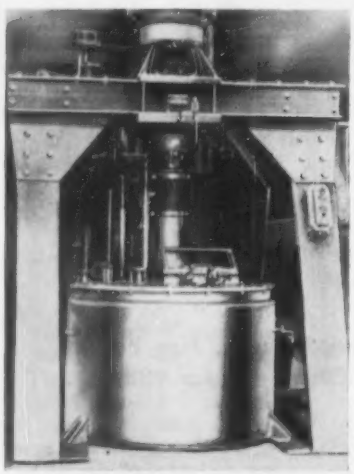


Suspended Centrifuge Is Fully Automatic

For product uniformity and maximum operating efficiency, an electronic master panel controls the cycling of this fully automatic suspended centrifuge. Units range from 20 to 48 in., and can be run by hydraulic or electric motor.

By eliminating manual operations, this system permits one operator to monitor a bank of such machines. They are started by pushbutton, then a valve opens to admit slurry. Feed can be controlled by timing or by an automatic cake-thickness detector (optionally available).

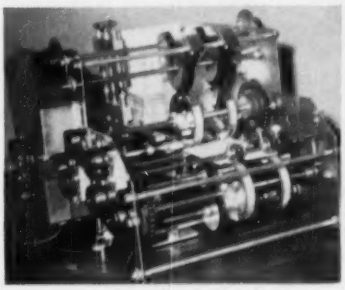
Units can also be set to spray the cake with a given number of washes before accelerating to high speed. After a predetermined interval they brake to unloading speed, which is maintained by a special switch. Then an automatic valve lifter removes the basket valve, permitting unloading through the basket bottom opening.

When basket is emptied, valve plate is automatically replaced and machine immediately begins another cycle. Latter can run as low as 150 sec. or as long as 32 hr. In the event of a severely unbalanced load, a safety device brings unit to a stop to prevent damage.

Should a cycle be interrupted, op-

crator can finish a batch by push-button operations for each step. As proof against double feed or spray, machine must complete one cycle before another can start.—*The Fletcher Works, Centrifugal Div., 201 Glenwood Ave., Philadelphia 40.*

Circle 110C on Reader Service Card

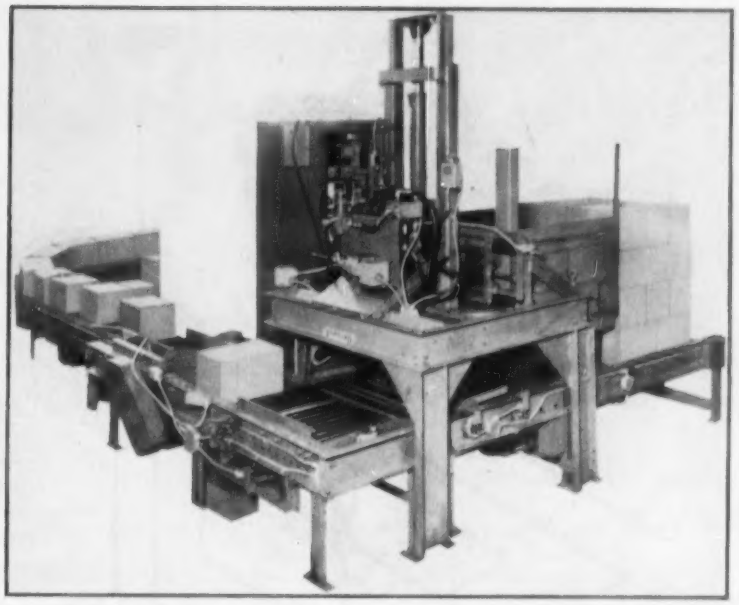


Prints Ice Cream Flavor On All Carton Faces

Incorporating a new bottom attachment, this coder now simultaneously prints flavor names on six sides of pint, quart, and half-gallon ice cream cartons in one pass through the unit. Speed is 92 per min. and there are no change parts.

Known as Model 1016-20, it is recommended mainly for printing of special items and slow movers, since most processors buy pre-printed cartons for popular flavors. The standard machine is 24 in. long, 20 in. wide, and 18 in. high. With bottom marking attachment, it is 10 in. longer. All imprints are made parallel to the edge of the pull flap.—*Kiwi Coders Corp., 3804 N. Clark St., Chicago 13.*

Circle 111A on Reader Service Card



Eliminates Pallets in Forming Unit Case Loads

This machine automatically takes up to 35 cases per min. from a conveyor and assembles them in a variety of unit loads—without using pallets.

Known as Unitizer, it receives packages in single file and place them in a pre-established pattern. When a tier is completed it is moved to a secondary position, and the next layer forms.

The first tier is then picked up by clamp arms and raised high enough to clear the succeeding tier being moved to the second position. When second tier is in second position, clamps lower the first tier to the top of the second, then continue down to pick up both tiers.

This operation is repeated until a predetermined number of tiers are in clamp position. Then, the load is lowered and conveyed to a discharge station for pickup by clamp-type trucks. At this point, standard wood pallets can be interjected.

Unit is floor mounted and requires no building alterations for installation. Loading and unloading elevations may be as low as 18 in.—*Standard Conveyor Co., North St. Paul 9, Minn.*

Circle 111B on Reader Service Card

Want More Information?

It's free—and easy to get. Simply note here the items on which you want more details, then circle each key number (there's one given at the bottom of each item) on the handy Reader Service Postcard—back of book. Then sign at the bottom and mail.

For your convenience, too, items in this department are listed and keyed in the Reader Service Section.

Valves Ground In Place By Handy Power Tool

Savings in labor and fuel, increased production, and power gains are benefits cited for this motor-driven valve reseating grinder.

With this unit (Dexter), one man can regrind any globe or gate valve from ¾-12 in. without removing the valve from the line. Unit employs a high-speed motor and abrasive-cloth elements for efficient operation regardless of material hardness. Grinding elements, in the form of cones and segments, are mounted on

78 JENKINS PRACTICAL PIPING LAYOUTS

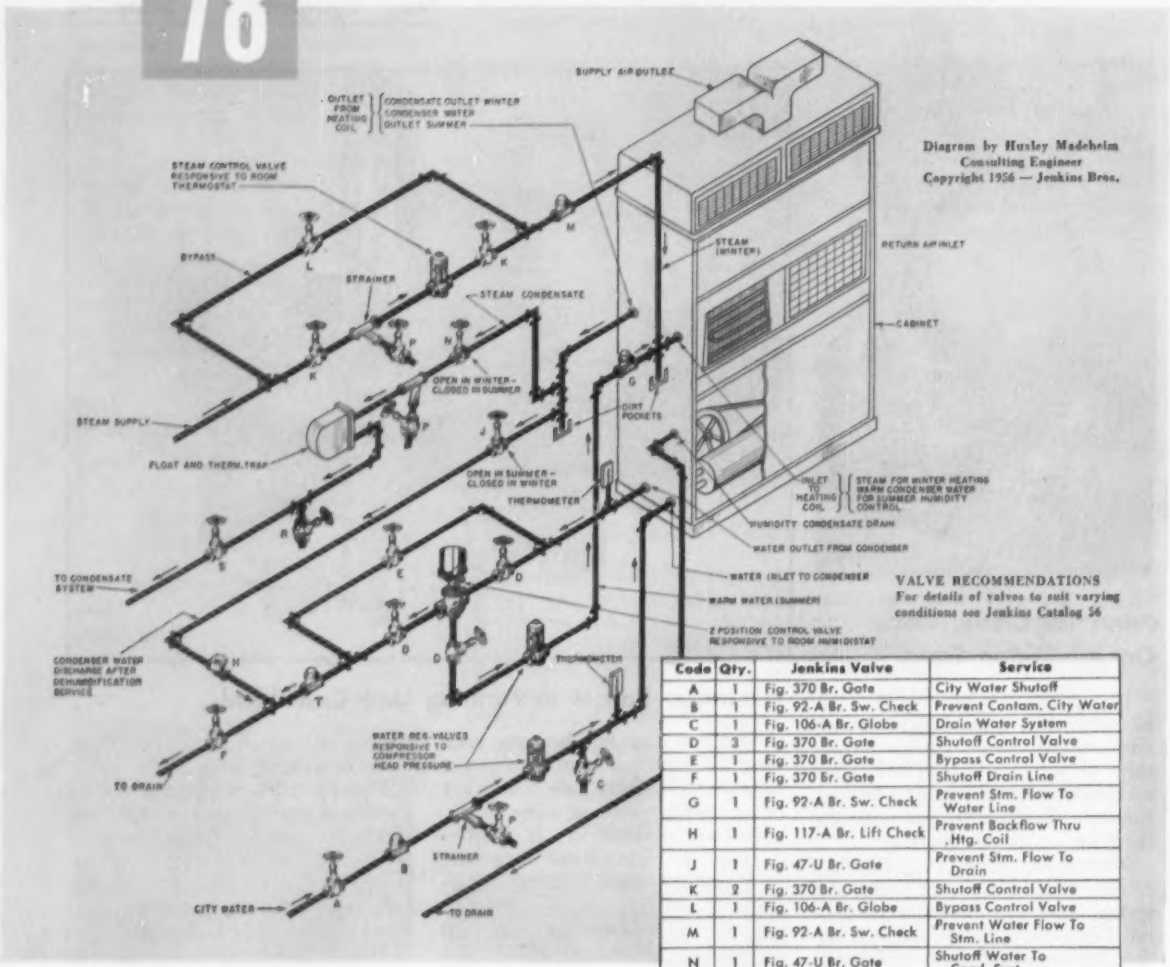


Diagram by Huxley Madeheim
Consulting Engineer
Copyright 1956 — Jenkins Bros.

VALVE RECOMMENDATIONS
For details of valves to suit varying conditions see Jenkins Catalog 56

Code	Qty.	Jenkins Valve	Service
A	1	Fig. 370 Br. Gate	City Water Shutoff
B	1	Fig. 92-A Br. Sw. Check	Prevent Contam. City Water
C	1	Fig. 106-A Br. Globe	Drain Water System
D	3	Fig. 370 Br. Gate	Shutoff Control Valve
E	1	Fig. 370 Br. Gate	Bypass Control Valve
F	1	Fig. 370 Br. Gate	Shutoff Drain Line
G	1	Fig. 92-A Br. Sw. Check	Prevent Stm. Flow To Water Line
H	1	Fig. 117-A Br. Lift Check	Prevent Backflow Thru Htg. Coil
J	1	Fig. 47-U Br. Gate	Prevent Stm. Flow To Drain
K	2	Fig. 370 Br. Gate	Shutoff Control Valve
L	1	Fig. 106-A Br. Globe	Bypass Control Valve
M	1	Fig. 92-A Br. Sw. Check	Prevent Water Flow To Stm. Line
N	1	Fig. 47-U Br. Gate	Shutoff Water To Cond. Syst.
P	4	Fig. 106-A Br. Globe	Strainer Blowoff
R	1	Fig. 106-A Br. Globe	Trap Test
S	1	Fig. 370 Br. Gate	Shutoff Condensate Flow

How to plan piping connections for an all-year

SELF-CONTAINED AIR CONDITIONING UNIT

A factory-built "package", the self-contained air conditioning unit shown in this layout is designed for both summer cooling and winter heating. In this particular system, it is assumed that steam is available for winter heating, and that the condenser is served by the city water supply. The condenser water discharge is used for the reheat necessary for humidity control.

The hookup for humidity control, particularly important for installations such as in night clubs, auditoriums, and others having a high moisture removal load, is shown in the diagram.

During the winter season, the heat output is regulated by a modulating steam valve which operates in response to a room thermostat. In the summer, another room thermostat starts the compressor when cooling is required, and the two-position water control valve, located as shown in the diagram, permits the water to flow to the drain.

When dehumidification is required without cooling, a room humidistat keeps the compressor in operation, but changes the position of the two-position water control valve so that the condenser discharge flows to the heating coil.

Two water-regulating valves are employed as illustrated. One, in the city water line, is set in the usual manner to maintain a predetermined head pressure on the compressor by varying the amount of water flowing into the condenser. The second, in the line from the condenser to the heating coil, is set for a head pressure higher than the pressure on the feed control valve.

This secondary condenser water control reduces cooling capacity and, at the same time, provides hotter water for reheat in the heating coil, thus serving to maintain proper relative humidity without excessive reduction of temperature. The amount of reheat obtained is approximately equal to the cooling provided by the unit, so that the net effect is that of dehumidification only, without cooling.

Consultation with accredited piping engineers and contractors is recommended when planning any piping system.

Enlarged diagram and full description of this layout free on request. Ask for Layout No. 78. Jenkins Bros., 100 Park Ave., New York 17.

JENKINS VALVES
LOOK FOR THE JENKINS DIAMOND
SOLD THROUGH PLUMBING-HEATING AND INDUSTRIAL DISTRIBUTORS

interchangeable rubber-coated heads.

Machine is available in compact kit form in three basic models.—*Leavitt Machine Co., 10 East River St., Orange, Mass.*

Circle 111-C on Reader Service Card

Telemetering Units Give Corrected Flow Values

A new system of telemetering instruments totalizes flow measurements, correcting for factors such as temperature, pressure, and density.

Consisting of transmitters, receivers, and electronic self-balancing devices, systems can be supplied in a variety of types to perform averaging, totalizing, multiplying, and dividing computations. In addition, they will extract square roots, square a reading, or compensate for a particular mathematical law.—*The Bristol Co., Waterbury 20, Conn.*

Circle 113A on Reader Service Card

Produce-Handling Cost Cut By New Pallet Boxes

Standard size wirebound pallet boxes are now available for economical handling of 500-2,000 lb. loads of fresh produce in harvesting, storing, processing, or shipping.

A heavy-duty unit with outside cleats is provided for ton loads of bulky items such as potatoes, melons, and apples. A lighter box is available for 500-1,200 lb. loads of beans, spinach, corn, and fruits. Where return of the box is not necessary, an expendable shipper is offered.—*General Box Co., 1825 Miner St., Des Plaines, Ill.*

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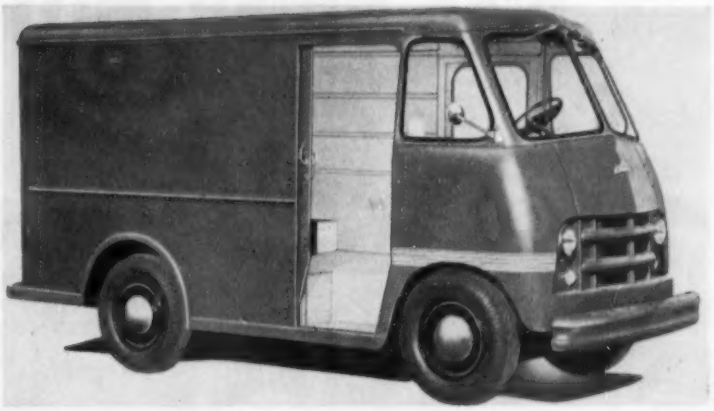


Lightweight Truck Body Eases Retail Delivery

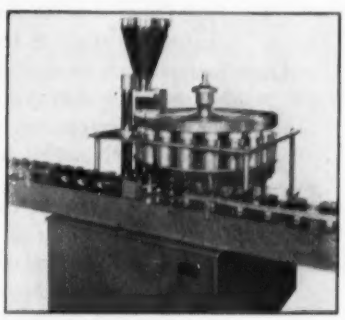
Design of this new forward-control body is said to boost operating efficiency on a variety of retail delivery routes.

Called Model MN-8 Merchandiser, it is built low and narrow for maneuverability. The lightweight body, of high-tensile steel, has a full-square load space providing a capacity of 242 cu. ft. Inside dimensions: Length, 102 in.; width, 66 in.; and height, 62 in.

The roof is insulated with Fiberglas, while interior sides and ceiling are lined with steel. Square wheelhouses make for efficient loading and floor is steel-covered. Also available are full-opening 66-in. rear doors that conveniently fold against the sides of the vehicle.

Other advantages include zinc-chromate protection on all parts, easily removable body sections, and thorough undercoating. Heavy rub rails at bottom, center, and top of each side minimize collision damage. Roof crowns and rear center posts are highly impact resisting. The body is available on any standard chassis.—*Boyertown Auto Body Works, Boyertown, Pa.*

Circle 113C on Reader Service Card



New Unit Speeds Filling Of Settling-Type Items

This 18-pocket rotary unit offers up to 300 accurate fillings per min., even where product settling is necessary to fill the container.

Known as Whiz-Packer, it handles items such as nut meats, crystals, and pellets with minimum breakage. Machine is compact and its conveyors are designed for use with existing equipment.

Unit has a "no can-no fill" device, a control for regulating underage and overage in weights where product density changes, and agitation for proper material flow. It is variable-speed driven and all product contact parts are of stainless steel and aluminum. Low maintenance and power requirements (two ¼-hp. motors) are reported.—*Frazier & Son, 20 Industrial West, Clifton, N. J.*

Circle 113D on Reader Service Card

Plastic-Tube Setup Offers Pushbutton Fumigation

Mills and elevators can now be equipped with pushbutton pest control through a new system of polyethylene tubing developed for safe use in fumigating.

It can be installed easily and

the most outstanding attraction
at the 41st NATIONAL HOTEL EXPOSITION will be the

1956 DINER-MOTEL CENTER

Built by:
MAHONY DINERS, INC.
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. . . featuring an exterior of

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The 1956 Diner-Motel Center marks the introduction of a plant manufactured Motel in addition to a completely equipped Diner-Restaurant. Since they offer closely related services, Diners and Motels are ideal companion products. Prefabricated Motels present many advantages over in-place construction—attractiveness of design, portability, low maintenance and are competitive in cost.

The exterior skin of the Diner and the trim of the Motel are both sheathed with our MicroRold 430 stainless. The interior of the Diner and many pieces of equipment and fixtures are also 430 MicroRold. Stainless steel was selected for its beauty and lustrous surface, strength, corrosion resistance and low maintenance. Type 430, non-nickel bearing, straight chromium stainless was specified because it is in immediate supply and not subject to government restriction. Significant also, in these days of high costs, is the savings of $215 per ton in base price as compared to the chrome nickel stainless.

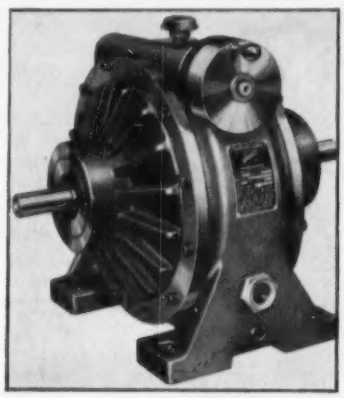
Washington Steel
Corporation
10-W WOODLAND AVENUE WASHINGTON, PA.

Consult your stainless steel warehouse distributor. He will gladly show you how to get more for your stainless steel dollar by using MicroRold 430 stainless.

quickly. No special tools are required since all tubing connections are made by hand. In case of building changes, the setup may be moved to new locations.

System employs a special fumigant (Aerosol Larvacide) in pressurized cylinders.—*Larvacide Products, Inc., 117 Liberty St., New York City 6.*

Circle 113E on Reader Service Card



Ball-Type Drive Provides 9:1 Speed Regulation

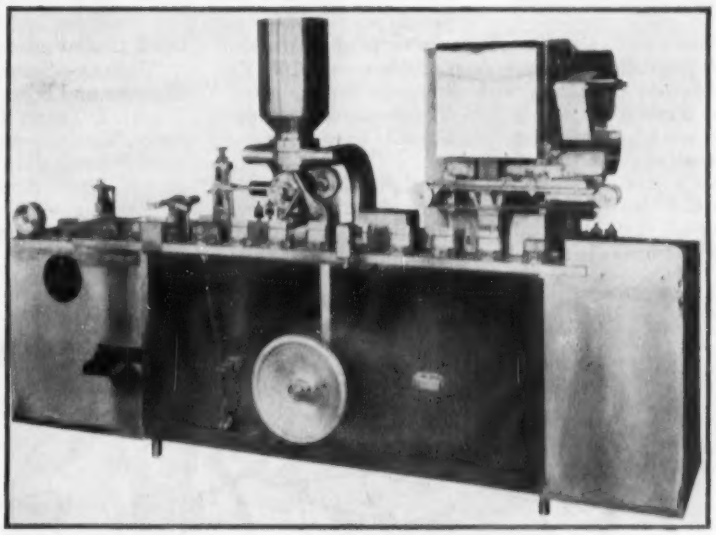
Here is a simple, compact drive designed to provide infinitely variable output speeds from a constant-speed power source.

Known as Speed Variator, it can be set for close speed regulation through a 9:1 range or modified for fine regulation over a restricted speed range. Employing the rolling action of a number of balls, unit permits smooth adjustment of output speed while operating under load.

In operation, power is transmitted through the input shaft to a beveled drive disk contacting the axle-mounted balls. Latter contact a similar disk on the output shaft. With speed of input shaft fixed, speed of output shaft is determined by the angular position of the axles.

Close control of speed adjustment is obtained by a worm drive that positions a speed-regulating iris plate. The adjusting worm can be operated either manually or through a variety of remote manual or automatic devices.—*The Cleveland Worm & Gear Co., 3261 E. 80th St., Cleveland 4.*

Circle 115A on Reader Service Card



Hot-Packs Cream Cheese In Foil Wrappers

This machine automatically packages 3- and 8-oz. units of hot-pack cream cheese in printed foil wrappers. Capacities are 53 per min. for the 3-oz. pack, 35 per min. on the 8-oz. unit.

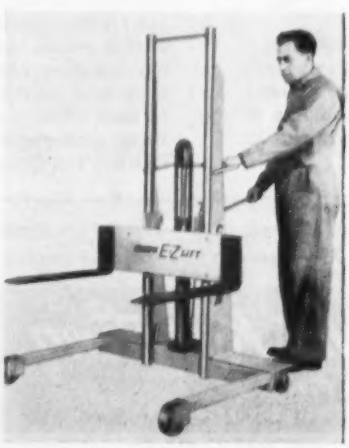
Using foil roll stock, it forms the package, fills it with 165-F. cheese, closes it, and delivers it to conveyors.

Employed are removable plastic molds which are automatically lined with foil wrappers. An electric eye prevents their being filled when no wrapper is present. This device, plus a new method of supplying foil wrappers to the cutting mechanism without tension, minimizes messy breaks.

When each mold is filled, it moves onto a series of mechanical folders, then under a vertically-mounted Neoprene belt at the end of the machine. This provides a proper fold and seal to prevent contamination. After traveling a short distance under the machine, molds pass a discharge outlet, then continue on the endless belt.

An easily adjustable mechanism permits close unit-weight control even while the machine is operating. Changeover for package size is said to be quick and easy.—*Marathon Corp., Menasha, Wis.*

Circle 115B on Reader Service Card



Eases Handling of Pallets In Confined Areas

Maneuverability of this 1,000-lb. capacity fork lift particularly suits it for operation in cramped spaces.

Manually-operated hydraulic unit (FL-100) raises pallets 54 in. above the floor. It has an overload release for operator safety and protection of material being handled. Lift's rubber front wheels and swivel-type rear casters have roller bearings. Its foot-operated brake employs a trigger release.

Spread of the 4 x 24 in. forks may quickly be changed from 36 to 24 in. by removing them from the back

S/K apades in industry

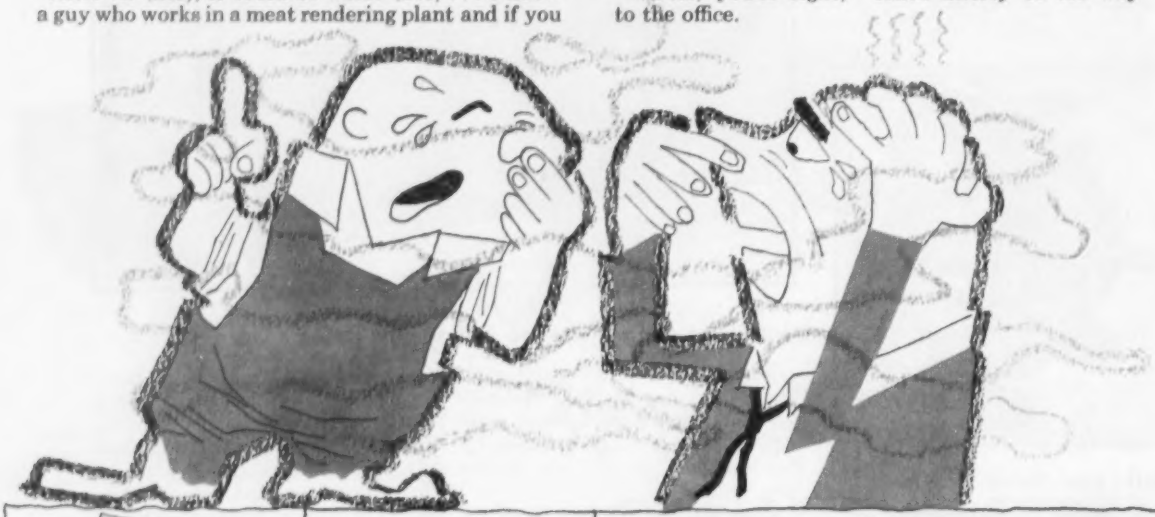
HOW TWO ENGINEERS BEAT THE HEAT AND SOLVED AN ODOROUS PROBLEM

The locale—the plant of a manufacturer of soap and allied products. The pressing problem—a 110° F temperature combined with ammonia fumes, produced during the making of Theobromine, which made working conditions unbearable in a section of the plant.

"Let's (kof-kof) look at the bright side, boss," suggested Shorty, the assistant plant engineer. "After all (kof), it could be worse (kof) . . . I know a guy who works in a meat rendering plant and if you think this situation smells, you—"

"SMELLS—SCHMELLS," screeched Barney, plant engineer and boss. "I KNOW (squrk) WHAT I THINK (hack). I THINK IF THIS SITUATION ISN'T SOLVED SOON, YOU'LL—*rendering plant?* You said rendering plant. SAY, didn't I see something about how an SK Fume Scrubber solved a fume problem in a rendering—"

"Boss, you're right," called Shorty on his way to the office.



"HERE IT IS!" shouted Shorty, reading, "SK FUME SCRUBBER ELIMINATES OBNOXIOUS FUME PROBLEM. Say, let's get an SK engineer in here."

And, they did. In no time at all, an SK Sales Engineer arrived, made an on-the-spot survey of the situation, and recommended the immediate installation of an SK 36" Fume Scrubber.

AND A BONUS—New, air cooling and fume removal are both accomplished by the Fume Scrubber. Hot air and fumes pass through the scrubber where the ammonia fumes are removed and the hot air cooled. The air then passes through a scrubber box (equipped with SK Spray Nozzles), is further cooled, passes through heaters which raise its temperature to 70° F and reduce humidity to 70%, and returns clean and cool, to the building. The only operating cost is that for power to pump the pressure water which comes from a nearby quarry and well.

MORAL: *Chemical processing, food, or petroleum refining—no matter what business you're in—get acquainted with SK Fume Scrubbers. Send for Bulletin 4-R. Make use of a jet apparatus specialist, your nearest SK Sales Engineer.*

Schutte and Koerting
COMPANY
MANUFACTURING ENGINEERS

2223 STATE ROAD, CORNWELLS HEIGHTS, BUCKS COUNTY, PA.

JET APPARATUS: Ask for Condensed Bulletin J-1.
ROTAMETERS & FLOW INDICATORS: Ask for Condensed Bulletin 18-RA.
VALVES: Ask for Condensed Bulletin V-1.
HEAT TRANSFER APPARATUS: Ask for Condensed Bulletin HT-1.
GEAR PUMPS: Ask for Bulletin 17-A.

plate and remounting at an extra set of holes. Straddle capacity is 38 in. A useful accessory is an interlocking platform that snaps into place to convert fork lift to a table lift.—*Crown Controls Co., 40-44 S. Washington, New Bremen, Ohio.*

Circle 115C on Reader Service Card

Longer Service Life Cited For Conveyor-Belt Hook

Now available is a new, larger belt hook for use with belts from 3/8 to 11/16 in. thick.

Called No. 7, it has a double-staggered grip for even distribution of hook-point pull, and withstands pulls up to 125 lb. per hook. Field tests indicate that it provides longer service on heavy-duty 2-ply leather belts and on 6- or 7-ply rubber-composition types. Use of longer hook points offers better clinching, which is essential for maximum service.

Hooks are carded using 0.1445-in. centers. A standard box contains twelve 12-in. cards with sufficient pins for joining.—*Clipper Belt Lacer Co., Grand Rapids 2, Mich.*

Circle 117A on Reader Service Card

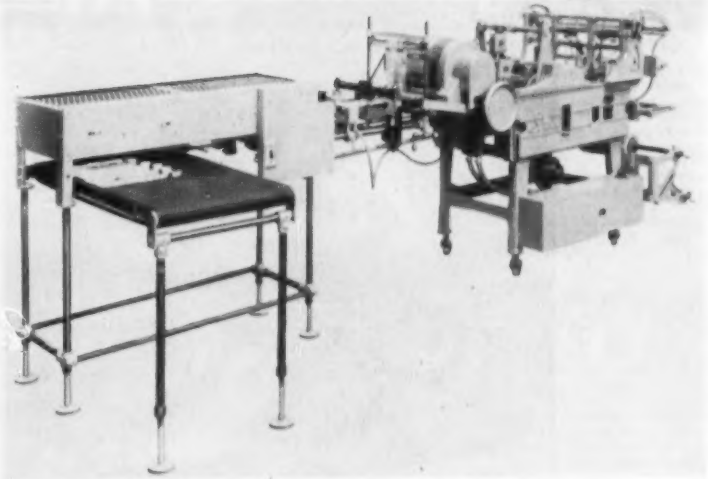
Steering Wheel's Design Ups Operator Safety

This new combination steering wheel and automatic clutching device is designed to minimize chances of accident to operators of lift trucks and other industrial vehicles with small turn wheels.

Its working mechanism in the hub assembly holds the steering gear stationary to prevent "kick-back" when guide wheels hit obstacles. This type of shock, which frequently catches an operator unaware, can break a bone or severely bruise the wrist. Turning the wheel releases the steering aid automatically to permit normal operation.

In addition, this device acts as an "automatic pilot" on the vehicle, holding it on course even over bumps, and without operator holding the wheel. A self-contained unit, it is permanently lubricated and sealed.—*Kosch Mfg. Co., Columbus, Nebr.*

Circle 117B on Reader Service Card



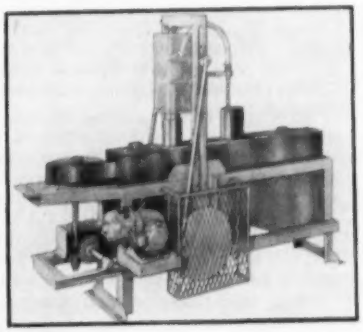
Bag-Making Machine Employs New Stacking Unit

Designed to boost efficiency and versatility of maker's Model 4-7 polyethylene bag-making machine, this stacker (left) uses a traveling gripper chain for continuous control of bags from cutoff to stack.

Known as Simplex 4-7, unit can be furnished for either right, left, or end delivery. It handles straight cut-off bags up to 36 in. long, and shinglestacks them in piles of 10, 25, or 50, with variable spacing. Only longer skip-cut lengths require machine adjustment.

Stacker keeps pace with the bag-making equipment, and one operator can inspect and pack the production of several machines.—*Simplex Packaging Machinery Div., Food Machinery & Chemical Corp., 534-23rd Ave., Oakland, Calif.*

Circle 117C on Reader Service Card



Opens, Empties, Rinses 14 No. 10 Cans/Min.

Automatic operation of this new unit permits opening, emptying, and rinsing of up to 14 No. 10 cans per min.

Called "101", it is designed for use with juices, soups, purees, pastes, crushed fruits, or any liquid or semi-liquid that will drain from a 4-in. opening. There is no danger of can slivers contaminating the product since the piercing bit does not cut the lid from the can. Spilling and splashing are eliminated.

The hollow, stainless-steel bit pierces the can from top through bottom, dishing the bottom for drainage. Product drains into a stainless-steel underpan, then can is rinsed, top to bottom, by an automatic spray nozzle. Three types of nozzles are available to provide the spray best suited to various consistencies.—*F. H. Langsenkamp Co., 229 E. South St., Indianapolis 25, Ind.*

Circle 117D on Reader Service Card

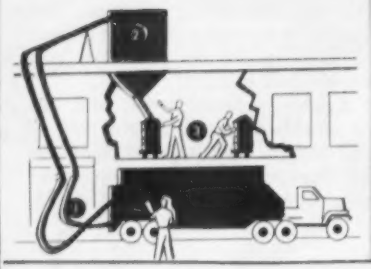
Centrifugal Pumps Use Interchangeable Parts

To provide the most efficient unit for a given service, a new line of centrifugal pumps employs inter-

Industry's Choice For Reliable Service
Bulk Sugar Tankers By \\CLOUGH//

Clough is a leader in specialized transportation equipment. The Clough sugar tankers, such as the ones pictured here, are manufactured with the assistance of Ray Murray, well known consulting engineer in the field of bulk food handling. Today, Clough is the choice of the sugar industry.

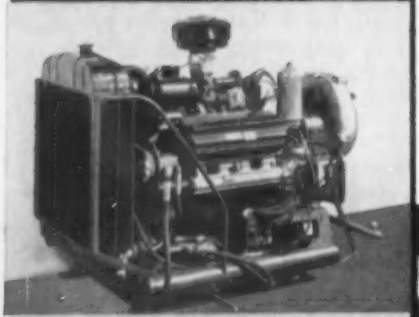
Picture below shows Clough trailer in typical unloading scene, operator manning the convenient control panel and sugar being transferred to customer's plant. The sugar tanker is pressure tested to a safety factor of four. At bottom is picture of unit power pack, heart of the sugar transfer system used in Clough trailers.



1. The Clough closed balanced pressure system makes the transfer operation convenient with control of all factors at the operator's finger tip. With a minimum of attrition, a 40,000 pound payload is elevated to the customer's storage in an average of 55 minutes.

2. Storage is no problem with bulk shipments. Convenient storage tank location insures a constant, ready-to-use supply.

3. Gravity flow provides distribution within the plant. From the time sugar leaves the silo until it is ready for use it is untouched by human hands.



Clough Equipment Company holds a position of leadership in the sugar transportation industry because years of experience in building all types of specialized highway trailers have given us the engineering skill to handle the exacting requirements of bulk sugar users.

Soon after the pneumatic discharge system of sugar handling was developed in the Pacific Northwest, Clough was called upon to build these specialized trailers. Today, The Amalgamated Sugar Company has a fleet of five dry sugar tankers, bringing low-cost, easy-to-handle sugar to some 35 big industrial sugar users, among them Continental Baking Co., Libby, McNeil & Libby and Langendorf-United Bakers. California & Hawaiian Sugar Company selected Clough to build the last two bulk tankers in its fleet of four. Spreckels Sugar Company recently joined the list of Clough sugar tanker users.

These bulk sugar users know the importance of fast, reliable service that eliminates costly sugar bags. The Clough closed balanced pressure system (patent pending) has eliminated wasted effort in sugar loading and handling. Plant operation continues during unloading operation.

\\CLOUGH//

"GO MODERN NOW WITH CLOUGH"

For further information about what Clough can do for you, write:

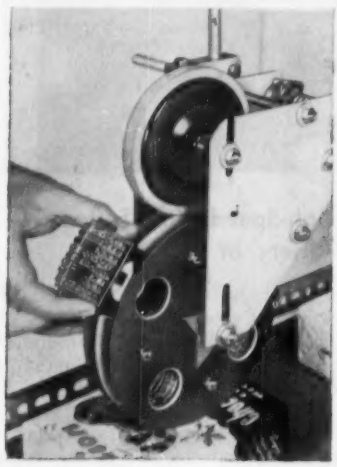
Clough Equipment Service Company
2739 Sixth Avenue South
Seattle, Washington

changeable components. In addition, inventory on replacement parts may be cut up to 85%.

Made in two basic designs, grease-lubricated (Type DL) and oil-lubricated (Type DM), they handle all process liquids, either hot or cold, against low, medium, or high heads. To either type frame, user adds the desired back plate (air or water cooled), impeller (open, with repelling vanes, or enclosed, with balance chamber), and volute case to "build" the pump for the intended service.

Units are available in discharge sizes from 1-4 in., capacities to 800 gpm., heads to 400 ft. Driver can be a standard, horizontal, electric motor mounted on common base with pump.—*Peerless Pump Div., Food Machinery & Chemical Corp., 301 West Ave., Los Angeles 31.*

Circle 117E on Reader Service Card



New Code-Dater Offers Easier Type Changing

This automatic code-dater employs a new marking device for fast and simple changeover.

Known as Model 6000, it has a compact removable unit (Liftype) consisting of numerals and letters permanently mounted on rotating bands. Type is simply changed by lifting out the unit and changing bands. And a turn of the wheel changes the code.

Unit can be supplied with 4 to 8 type bands, each having 13 letters and a blank space, or 10 numerals and blank spaces. Type sizes range from $\frac{1}{16}$-$\frac{1}{4}$ in. high.

Machine imprints on cartons, cans, bottles, boxes, and bags. Information such as flavor, price, and weight can be marked separately or in conjunction with the code. It is easily attached to all types of conveyors, and prints on top, bottom, or side of any shape container.—*Acro Tool & Die Works, 4554 N. Broadway, Chicago 40.*

Circle 119A on Reader Service Card

High-Speed Can Filler Eliminates Foam

Foamless filling of 3- and 5-gal. milk cans at high speed is reported for this new automatic unit.

Known as Jiffix, it operates at 40 psi. to fill two containers simultaneously. Capacity is six 3-gal. (or four, 5-gal.) cans per min. Changeover for can size takes less than 2 min., and semi-automatic operation is possible.

A siphon-type dripless foam line in the filling valve keeps the working area clean and cuts product loss. Filling is by volume and the valve, which has a condensate guard, is easily detached for cleaning or for changing can gaskets.

One man operates the unit by placing two cans at a time and removing the lids. Cans are automatically moved into position, filled, and discharged from the elevator ready for sealing and tagging. The filler tank has an electrode-type, floatless liquid-level control.—*Creative Metals Corp., 1290 Powell St., Emeryville, Calif.*

Circle 119B on Reader Service Card

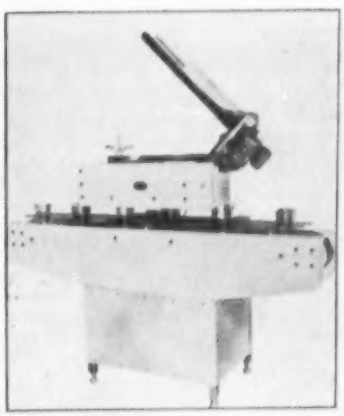
Portable Dock Unit Speeds Truck Loading, Unloading

A mobile dock that mounts a telescoping conveyor is said to speed truck loading and unloading from ground to body level. Called Combination Telescopic Conveyor and Dock, it is recommended for plants having no dock or where the dock platform is considerably lower than the truck flooring.

In loading operations, dock is wheeled into position and a hinged ramp is dropped to span the distance between truck floor and dock. A power conveyor raises goods to the telescoping sections leading into the truck. As latter is loaded, conveyor is gradually shortened until the entire unit rests on the dock.

For rapid unloading, dock is simply wheeled around and the power belt is replaced by another telescoping conveyor. Its sections are gradually extended into the truck as it is unloaded.—*Wilkie Co., 5520 Arch St., Philadelphia, 39.*

Circle 119C on Reader Service Card



Caps Plastic Containers At 150 Per Min.

This unit applies semi-rigid plastic closures to semi-rigid or rigid containers which require gradual roll-on pressure for proper seating.

Called Model 55-CF, it handles up to 150 containers per min., depending on size and type. Capper employs a chrome-plated loading tube for closures or caps (capacity 100 caps), a chrome-plated chute

Why you get more service from V-Belts with CONCAVE SIDES

Fig. 1

Fig. 1-A

Each sidewall of a Gates V-belt is concave (Fig. 1)—a precisely engineered curve that makes V-belts last far longer.

HERE'S WHY: on the bend around the sheave, the concave sides of a Gates V-belt fill out and become straight (Fig. 1-A). Thus the belt makes full contact with the sides of the sheave, grips the sheave *evenly*. This even contact distributes wear uniformly across the sides of the belt.

Uniform wear lengthens belt life; keeps costs down.

MAKE THIS SIMPLE TEST

Fig. 2

Fig. 2-A

Bend a straight-sided belt (Fig. 2). The sides bulge at the bend causing uneven contact in the pulley groove (Fig. 2-A). Naturally, wear is greater at points indicated by arrows. Result: shorter belt life, increased belt costs.

To cut down-time and V-belt replacement costs, specify belts that grip evenly and wear longer. Specify Gates Vulco Rope—the V-belt with concave sides. There is a Gates distributor nearby who will quickly supply the belts you need. The Gates Rubber Co., Denver, Colorado—*World's Largest Maker of V-Belts.*

There are Gates Engineering Offices and Distributor Stocks in all industrial centers of the United States and Canada, and in 70 other countries throughout the world.

Gates

TPA 109

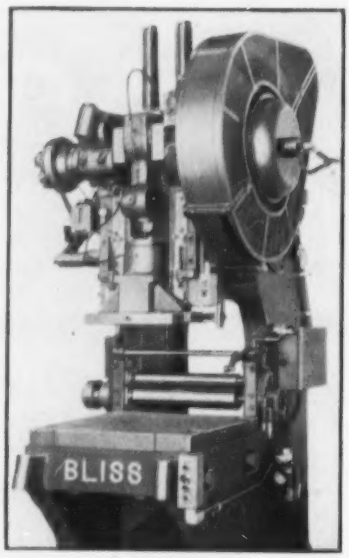
Gates VULCO ROPE Drives

Equipment & Supplies

slide and vibrator unit, and a series of rollers for applying the cap. Entire unit is mounted in a closing head, which is quickly adjusted for various height containers having the same diameter cap size.

The cabinet is 28 in. wide by 20 in. deep. Conveyor height is adjustable from 32-36 in.—*W. H. Swanson & Co., Wilmette, Ill.*

Circle 114D on Reader Service Card



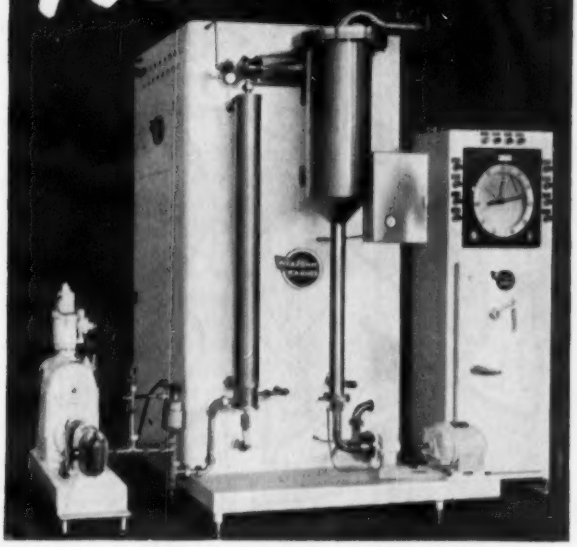
High-Speed Unit Forms Variety of Foil Trays

This press is specially designed for rapid and economical production of pie and cake plates, "TV" dinner trays, and similar aluminum-foil items.

Known as 21½-F "Foil Press", unit has a capacity of 50 tons. It incorporates a single-roll feed that takes foil directly from a coil and feeds it forward across the die area. An 18-in. depth of throat and a large back opening permit use of 24½-in.-wide feed rolls, and a maximum feed length of 18 in. These factors, combined with a flanged slide and heavy-duty air counterbalances, offer a wide range of large single-die or smaller multiple-die work.

A variable-speed drive provides 60-120 strokes per min. To minimize vibration and resulting wear on close-fitting foil dies at high speeds and long strokes (5-8 in.), heavy legs are cast integral with the frame. And all important adjustments can be made from floor level,

Positive Heat and Moisture Control



Pat. Pend.

NEW W. F. & JOHN BARNES

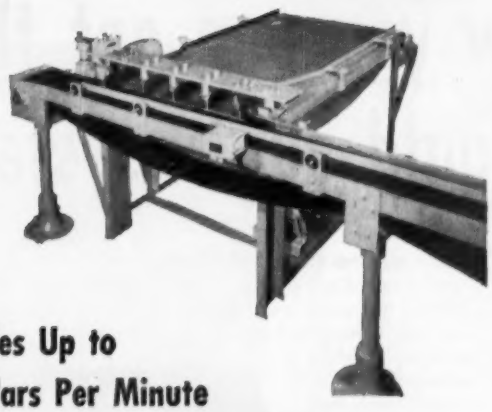
Roto-Jet

HEAT EXCHANGER

A More Efficient HTST Steam Injection System

The new Barnes Roto-Jet Heat Exchanger utilizes the principal of steam injection for high temperature, short-time processing or sterilization of liquid and semi-liquid products. Maximum efficiency and economy are obtained through the direct injection of purified steam into the product with minimum heat loss. A unique control system, exclusive with Barnes, provides positive processing temperatures within ± ½° F. to insure efficient and dependable product processing. Accurate control of product moisture content is consistently maintained. Manufactured and sold by W. F. & John Barnes Company.

Contact Barnes today and find out how this new Roto-Jet Heat Exchanger can be tailored to your specific requirements.



Pat. Pend.

Handles Up to 600 Jars Per Minute

W. F. & JOHN BARNES SINGLE FILERS

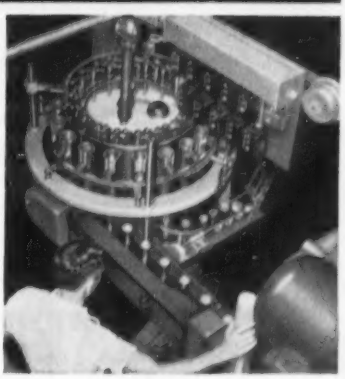
Designed especially to suit your needs for high speed glass unscrambling. Gentle handling results in essentially no glass breakage at extremely high speeds. Speeds up production and eliminates costly glass breakage and down time. This easily operated, easily maintained machine will handle in excess of 600 baby food jars per minute! The continuous operation of gently oscillating, non-scratching bronze fingers on the discharge head affords maximum production with minimum container damage.

Write for free literature—illustrates and describes these profit-making units.

High Output, Low Maintenance Cost

Librascope Fillers

Units feature exclusive self-cleaning action that prevents build-up of product on valve guides and ports — eliminates frequent cleaning operations. Plunger-type valve design insures positive closure against leakage, assures correct filling level, provides longer life. Range of standard models available to meet your production needs. Manufactured by Librascope, Inc. Exclusive Distributor: W. F. & John Barnes Company.



Builders of Better Machines and Equipment since 1872

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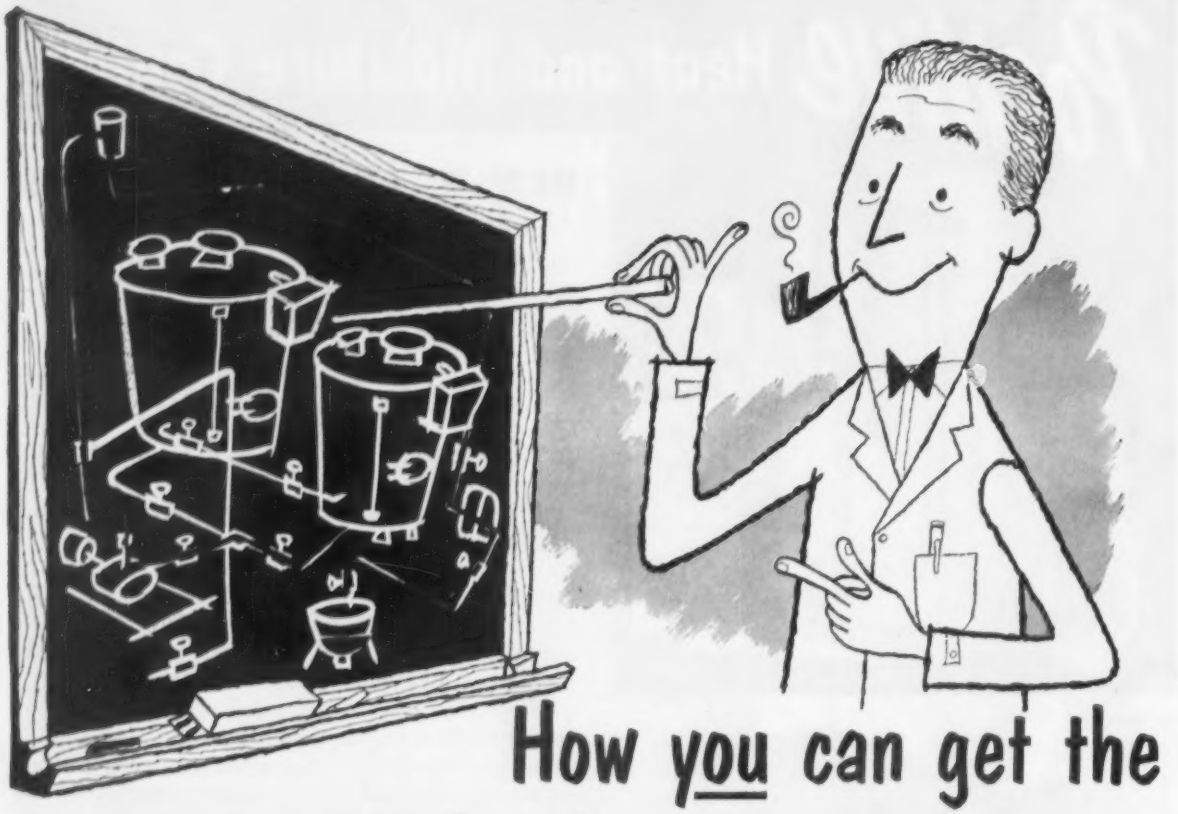
FOOD & CONTAINER SECTION

407 S. WATER STREET • ROCKFORD, ILLINOIS

DOLE ASEPTIC CANNING EQUIPMENT • RETORT BASKET LOADERS AND UNLOADERS



How you can get the most out of a liquid sugar system

"These three hints," maintains your Flo-Sweet Engineer, "will help you get the most out of your liquid sugar system.

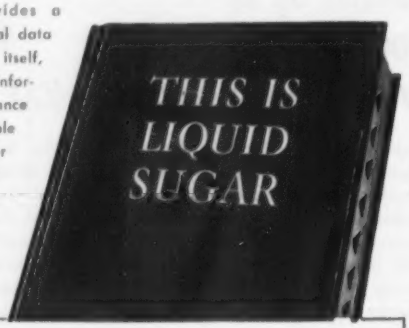
"First, make sure the system is designed by engineers who are experienced both in liquid sugar and in the technology of your food products.

"Second, have these engineers install the system.

"And third, use only top quality liquid sugar, blended accurately to your individual specifications.

"Here at Flo-Sweet we're in the habit of helping food manufacturers with all three of these important steps. In fact, that's our one and only business. If you aren't already enjoying the convenience . . . the sanitation . . . the cost-cutting and quality-improving advantages of a Flo-Sweet system — why not check with us today?"

"MUST" READING FOR EVERY SUGAR USER: This authoritative new manual contains over 200 pages of detailed information on the design, installation and operation of liquid sugar systems. It covers the use of liquid sugar in major food industries, provides a wealth of technical data on liquid sugar itself, and gives specific information on performance and costs. A valuable reference work for every food technologist's library. Price $5.00.



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YONKERS, NEW YORK

FLO-SWEET
FIRST IN LIQUID SUGAR

SERVING INDUSTRIAL SUGAR USERS EXCLUSIVELY
FROM YONKERS—PITTSBURGH—TOLEDO—DETROIT

which speeds changeover from one job to another.—*E. W. Bliss Co., 1375 Raff Rd., Canton, Ohio.*

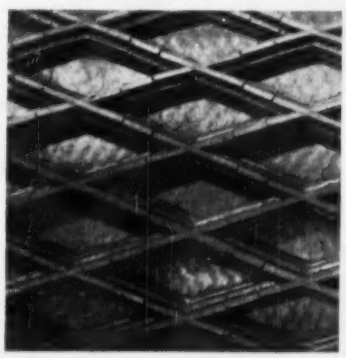
Circle 122A on Reader Service Card

New Multi-Item Cartoner Is Fully Automatic

Designed for flexible operation, a new bucket-feed cartoner packages a variety of items in straight-or reverse-style tucked containers, glued cartons, or a combination of both.

A continuous-motion machine (Model 50 Cartoner), it is fully automatic from hoppering, to loading the product to be packaged, to closing or glueing the carton. Capacity on double-pillow packages of cake mix is 100 per min. In addition, there are automatic safety controls such as a no-product, no-carton device. — *Container Equipment Corp., Bloomfield, N. J.*

Circle 123A on Reader Service Card



High Gripping Power Cited For New Conveyor Belt

Three-deck design of this new conveyor belt cover is said to give extra gripping power for handling all types of packages on 30-35 deg.

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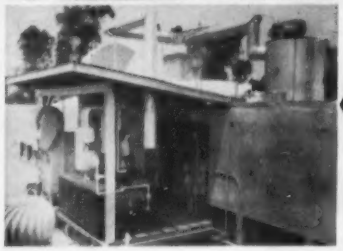
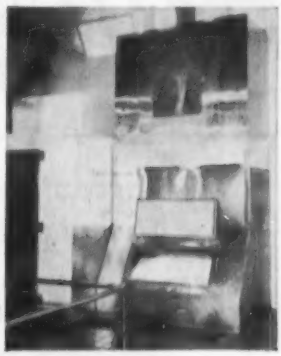


KNOTT'S BERRY FARM and GHOST TOWN

Knott's Berry Farm, Buena Park, California, is nationally known, having millions of visitors annually. The Steak House has served as many as 193,000 steaks in one year.

The Vilter Polarflake Ice Making Unit on the roof is serviced by a 15 HP Vilter F-22 compressor unit.

Stainless steel Polarflake storage bin. Capacity of freezer about 4½ tons of Polarflakes per 24 hours.



Q- Why does Vilter enjoy "high acceptance" in the food industry?

because A. Vilter REFRIGERATION is always so dependable and costs less to own*

Says Mr. Dwight P. Anderson, Manager, Steak House, Knott's Berry Farm, "We are pleased to recommend the Vilter Freon Polarflake Ice Machine. The Steak House has served as many as 6,500 guests in one day. Accommodating this number of guests is quite an accomplishment and therefore we need the very best of equipment. The Vilter Polarflake Ice Machine keeps us supplied with the large amount of ice we need for icing our water and beverages."

It is just such reliable performance as this that makes Vilter equipment an excellent investment. It is equipment that performs well continuously . . . does its job right, and with a minimum of attention.

Vilter Polarflakes are cold, crisp flakes, or chips of ice. Easy to handle, they pack around the product, yet will not arch as the ice melts. Polarflake ice can be easily stored in any type of suitable bin until it is needed. They are ideal for the fishing, poultry, meat, and dairy industries.

If you have a refrigeration problem in the food industry, it will pay you to rely on dependable Vilter equipment. Write us about your refrigeration problem.

Equipment sold through Refrigeration Machinery Corp., Vilter Distributor, Wilmington, California.

* Savings in low first cost are not the complete answer when considering the installation of refrigeration equipment. But savings in terms of years of extra service, reliable performance and minimum maintenance—that's where Vilter excels in low-cost ownership.

Vilter QUALITY CRAFTSMANSHIP that lasts... ENGINEERING DESIGN that guarantees performance

REFRIGERATION and AIR CONDITIONING

THE VILTER MANUFACTURING COMPANY, Milwaukee 7, Wisconsin

Air Units • Ammonia & Freon Compressors • Booster Compressors • Baudelot Coolers • Water & Brine Coolers • Blast Freezers • Evaporative & Shell & Tube Condensers • Pipe Coils • Valves & Fittings • Pakice & Polarflake Ice Machines

what is your
PULVERIZING
problem?

accept this offer by
Schutz-O'Neill for a

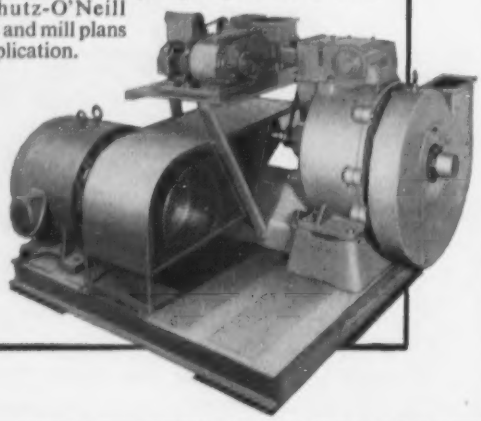
FREE TEST GRIND

OF YOUR MATERIAL SAMPLE

Without obligation to you, we'll grind a sample of your material in our Pilot plant, using a production model Schutz-O'Neill Superfine Pulverizer. This is a bonafide, no-strings offer to demonstrate to you the versatility, particle size range and capacity of Schutz-O'Neill Pulverizers. Write us for details.

OUR ENGINEERING TEST REPORT together with your processed product will be returned to you giving exact data and recommended Schutz-O'Neill equipment, methods and mill plans for your process application.

SCHUTZ-O'NEILL PILOT PLANT
uses a standard production model 16" Superfine Pulverizer, which provides up to 100 different pulverizing set-ups with a grinding range from 40 mesh to 5 microns.



ULTRAFINE GRINDING WITH CONTROLLED PARTICLE SIZE RANGE

WRITE US FOR DETAILS OF TEST GRIND OFFER

You'll find Schutz-O'Neill Superfine Pulverizers best for ultrafine grinding with controlled particle size distribution—yet their versatility also makes them adaptable to the complete grinding range from coarse to ultrafine.

Many heat sensitive products can be safely pulverized, because the grinding principle of impact with air attrition embodied in Schutz-O'Neill design keeps product temperatures down and helps control uniformity.

Typical Schutz-O'Neill applications are in the paint industry; major cocoa powder, sugar, spice and pharmaceutical manufacturers; processors of emulsifier gums, resin, plastic and seaweed extract powders and a great number of others. From 62 years of continuous manufacturing and field experience, Schutz-O'Neill may already have the answer to your problem. Superfine Pulverizers are made in six sizes ranging from 7½ to 125 horsepower with grinding chambers 12" to 28" in diameter.

Tell us your milling requirement—fineness, uniformity, increased output, lower cost—send us a sample of the stock you want to pulverize, state fineness and capacity desired, or send for Schutz-O'Neill bulletin.

ESTABLISHED 1893

SCHUTZ-O'NEILL COMPANY

309 Portland Avenue • Minneapolis 15, Minnesota

PULVERIZERS
GRANULATORS
ROLLER MILLS
AIR CLASSIFIERS
SIFTERS
HAMMERMILLS

Equipment & Supplies

inclines. Items carried range from cans to rough cloth bags. Certain types of smooth, hard packages can be conveyed on inclines to 45 deg.

Criss-crossing ribs form small, open-center diamonds on the surface of the belt (Wedge-Grip). They are of step-down design, hence as each step wears a new rib is presented for use. This construction also makes the top and second ribs more stable because of their broader supporting bases. Ribs are sliced at regular intervals to provide gripping fingers which adjust to uneven surfaces.

Of soft but abrasion-resistant rubber, the belt is available in widths to 60 in. with edges coated black.—*Goodyear Tire & Rubber Co., Akron 16, Ohio.*

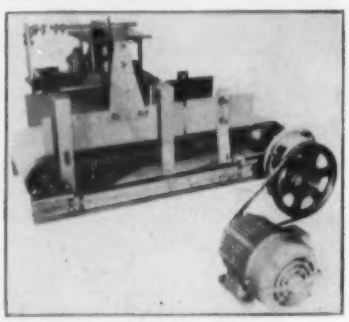
Circle 123B on Reader Service card

Non-Skid Tread Plate Ups Plant Safety

Used on slippery surfaces, such as aisles, catwalks, and truck and trailer floors, a non-skid abrasive aluminum treadplate offers sure footing even when covered with oil, grease, or water.

A layer of fused abrasive oxide is metallurgically bonded to one side of the plate, and does not separate in welding. Product is durable and corrosion-resistant.—*Aluminum Co. of America, Pittsburgh, Pa.*

Circle 124A on Reader Service Card



Package Conveyor Scale Has Many Applications

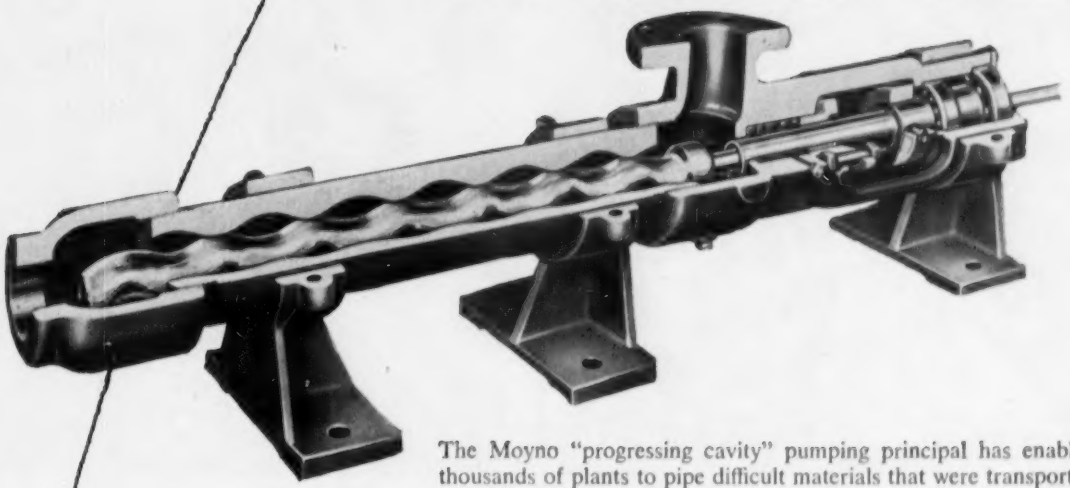
Available with integral belt conveyor and drive assembly, this unit performs numerous functions—indicating, recording, controlling, integrating, proportioning, and programming.

It employs a pneumatic weight transducer and a special flexure platform for accuracy despite load place-

from abrasive slurries to delicate foods . . .

MOYNO® PUMPS

CUT HANDLING COSTS



The Moyno "progressing cavity" pumping principal has enabled thousands of plants to pipe difficult materials that were transported by hand and other expensive means. Moyno is the only pump that can handle many abrasives, pastes, slurries, chemicals, foods, suspended solids, etc. without foaming, aerating, crushing or excessive pump wear.

As shown above, Moyno Pumps have a screw-like rotor that revolves in a double threaded stator creating progressing cavities which smoothly move material through the pump. They will pump anything that will move through a pipe . . . even plaster and non-pourable pastes!

Moyno Pumps are available in capacities up to 500 gpm and pressures up to 1000 psi.

Examine your processing methods. No doubt there are several places where Moyno Pumps can drastically cut costs. Ask us, we'll give you a frank answer. Send us an outline of your problem today! Write for Bulletin 30-FE

ROBBINS & MYERS, INC.

SPRINGFIELD, OHIO — BRANTFORD, ONTARIO

For more data, circle this page number on card at back →

Gerber Products Company—

Handling food at lowest possible cost . . . via CLARK'S LP GAS!

Prerequisite to economical handling *methods* is low-cost *operation* of mechanical handling equipment. It's why Gerber Products Company has turned to Clark's LP Gas.

LP Gas is a *dry* fuel that burns clean with nearly perfect combustion. It leaves no carbon or lead deposits, does not dilute cylinder lubricants. Because of this, overall maintenance is kept at a minimum—down time and overhaul time is greatly reduced—the operation remains fume free.

Then consider Clark's factory installed LPG system—completely sealed with hydrostatic pressure relief valve and self-sealing couplings. Safety features include vacuum switch and solenoid which automatically lock off fuel flow when ignition is off or when engine stalls. And Clark offers a complete line, all U-L approved, in capacities from 2000 to 7000 lbs.

There's no question as to the value of LP Gas in a food operation. The question is, what *you* are going to do about it. Let your local Clark dealer fill in the details. You'll find him listed in the Yellow Pages under "Trucks, Industrial."

A BETTER BUY WITH LOCAL SUPPLY—*Genuine Clark Parts*

CLARK® EQUIPMENT

Industrial Truck Division
CLARK EQUIPMENT COMPANY
Battle Creek 14, Michigan

Equipment & Supplies

ment or pile-up. Scales can be supplied for flows of 5-30 tons per hr. of material having a density of 100 lb. per cu. ft. (or equivalent). Precision is one part in 2,000, sensitivity is one part in 5,000. Unit has no springs, knife edges, or beams, and is unaffected by side-thrust forces.— *Weighing & Control Components, Inc., Box 245, Hatboro, Pa.*

Circle 124B on Reader Service Card

Cite Advanced Design Of Can-Body Machine

Speeds of 400-500 per min. are reported for a new can-body making and soldering machine. Called No. 501, it produces cans of 2⅛-4¼ in. dia., and 2¾-5¾ in. high.

Advantages cited: All crank-actuated motions from a central crankshaft, cam-actuated body clamp, V-belt drive through helical gears, and a high-torque brake that stops feed bars on the back stroke. Automatic stops throughout the machine act as a safety device if a jam should occur. — *Baldwin-Lima-Hamilton Corp., Hamilton, Ohio.*

Circle 127A on Reader Service Card

New Ingredients

True-Fruit Extract Offers Fresh Blueberry Taste

Ice cream, syrups, and pie fillings are typical applications for a new true-fruit flavor extracted from blueberries.

Economical to use, the potent flavoring is said to incorporate the delicate taste of the ripe fruit.— *Felton Chemical Co., 599 Johnson Ave., Brooklyn 37, N. Y.*

Circle 127B on Reader Service Card

Juice-Processing Time Cut By Concentrated Enzyme

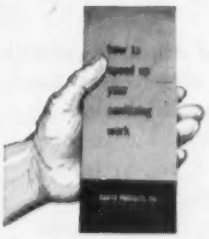
Clarification of apple juice may be sped by use of a pectic enzyme now in more concentrated form.

Used at the rate of 2 lb. to 1,000 gal. of cider, enzyme (Pectinol RA-5) usually gives complete clarification overnight when juice is held around 70F. Lesser amounts are required for treatments at higher tem-

you've got low-cost sanitation right in the palm of your hand

No bigger than a pipe bowl, yet the Hozon Unit does a mammoth job of helping to deliver low-cost spray sanitation. This unit, hooked up with an ordinary garden hose, permits regulated amounts of Oakite Bactericide to be sprayed from the hose nozzle. Makes sanitizing walls, floors, equipment—all areas—as simple as watering a lawn.

No higher than a hill of beans, yet this tiny amount of Oakite Bactericide is sufficient to make up a 10 gallon, 100 ppm solution of the best sanitizing agent available. It's Oakite Bactericide . . . with its near neutral pH that permits bug killing within 5 seconds after application. It's Oakite Bactericide . . . that mixes quickly, drains freely, and leaves no films or streaks.



No bulkier than a time-table, yet this handy descriptive folder is chock full of facts on how Bactericide and the Hozon Unit team up to drive spoilage out of your plant. It gives complete details on how the Oakite Hozon Unit works, how solutions are made up, where to use it.

No costlier than a stick of chewing gum. The amount of Bactericide to make up that 10 gallon solution costs *less than one cent.* And here's the big news. The Hozon Unit is FREE to users of Oakite Bactericide and the folder is FREE on request. Write today for the full story on how you have low-cost sanitation . . . right in the palm of your hand. Oakite Products Inc., 26G Rector Street, New York 6, N. Y.

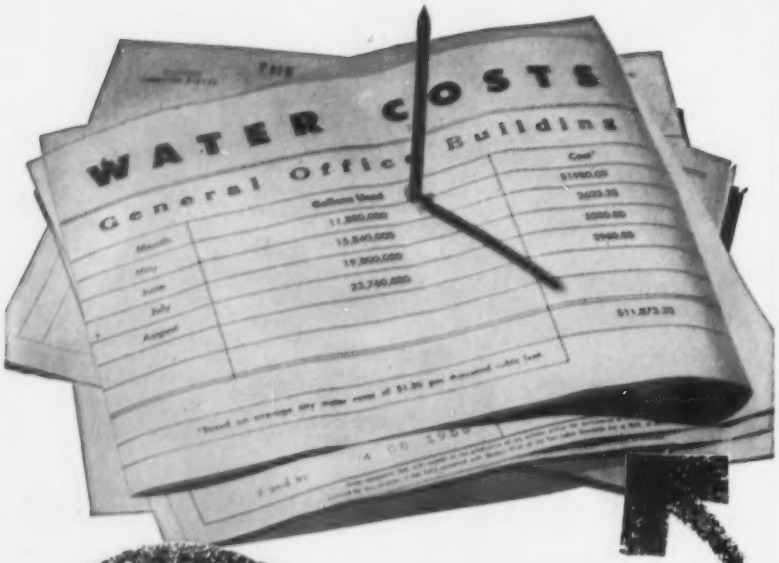
SPECIALIZED INDUSTRIAL CLEANING

OAKITE

MATERIALS • METHODS • SERVICE

Technical Service Representatives in Principal Cities of U.S. & Canada

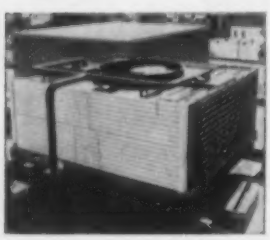
For more data, circle this page number on card at back →



Your water bill is subject to a discount of 95%!

You take advantage of all trade discounts, however small, because you know they add up—and may on occasion even mean the difference between profit and loss. But are you aware that by owning a Marley cooling tower you can save 95% of the water you require for air conditioning, refrigeration or process cooling?

A Marley cooling tower makes each gallon of available water do its job 20 times over, thus saving 95 out of every 100 gallons. These savings quickly amortize the cost of the tower, and subsequent savings through the years are pure profit. In effect, your Marley tower also insures continuous plant operation when droughts, floods, or freezes jeopardize your normal water supply. And of course, Marley towers satisfy all local water-conservation ordinances.



The foremost authority on discounting water bills with a cooling tower is your Marley Application Engineer. Call him today for an "audit" of your water problems, present or potential. No obligation, and you'll always be glad you did.

The Marley Company
Kansas City, Missouri

MARLEY

New Ingredients

perature, and range of maximum activity is 130-140F.—*Rohn & Haas Co., Washington Square, Philadelphia 5.*

Circle 127C on Reader Service Card

Brew Adjuncts Replaced By Special Corn Syrup

Brewing tests using a new high-fermentable corn syrup indicate that it is now possible to replace up to 100% of adjuncts with this new product. Furthermore, a finished beer of superior taste, color, clarity, and stability is produced.

Designated Rex Brand No. 1621, syrup is made by enzyme conversion and refined by ion exchange. It contains a high percentage of fermentable extract, closely approximating that of the average wort.

Principal processing advantages cited in use of this syrup are a 20-30% increase in production, and a substantial reduction in handling time and costs through elimination of unloading, weighing, and conveying of dry adjuncts.

Formerly, the chief deterrent to complete replacement of adjuncts by conventional syrups was an objectionable sweet-bitter after taste imparted to the finished beer. This defect is said to be overcome by the new product.—*Corn Products Sales Co., Brewing Materials Dept., 17 Battery Place, New York City 4.*

Circle 128A on Reader Service Card

New Chemicals

Wall Coating Rejuvenates Weatherbeaten Buildings

Recommended for use on a variety of masonry, metal, and wood structures, this exterior wall coating is said to eliminate painting and maintenance problems.

Known as Re-Nu-It, product comprises a waterproof vehicle incorporating earth and chemically treated pigments, a formulation that permits walls to breathe. Available in 11 colors, it coats a surface with a weather-resistant finish.

Maker also announces the establishment of a free consultation service to provide technical assistance on building repair and maintenance problems.—*Re-Nu-It Corp., 424 W. 42nd St., New York City 36.*

Circle 128B on Reader Service Card

New Chemicals

Electrical Units Protected By Waterproofing Agent

Electrical equipment, such as motors, may be effectively waterproofed by treatment with a solution called Electro-Seal 55-A.

It is a non-toxic, transparent material that can be brushed on or used as a bath into which units are dipped. A thin protective film results when solution has drained and dried. Equipment can be used within a day after application.

The film has high dielectric characteristic and also protects against alkalis, acids, and rust. Solution is available in 1, 5, and 55-gal. containers.—*Electro-Seal Co., U.S. 131, Plainwell, Mich.*

Circle 129A on Reader Service Card

Wide Application Seen For Potent Defoamer

Formulated for effective foam control in continuous diffusers of sugar beet plants, this antifoam agent is termed applicable to many similar food-processing operations.

Product (BX-108) is based on specially fractionated edible vegetable oils. It is low in bacteria content, bland, dark amber in color, and weighs 7½ lb. per gal.

Used diluted or applied direct, material is a free-flowing liquid that requires no preheating. It is easily handled in automatic systems, can be closely regulated, and doesn't clog drip valves. It is stable during prolonged storage, effective in low concentrations.—*Hodag Chemical Corp. 7247 N. Central Park, Chicago.*

Circle 129B on Reader Service Card

Bottle-Washing Cost Cut By Caustic Concentrate

Efficiency of this new caustic concentrate is attributed to superior wetting, deionizing, draining, and rinsing properties.

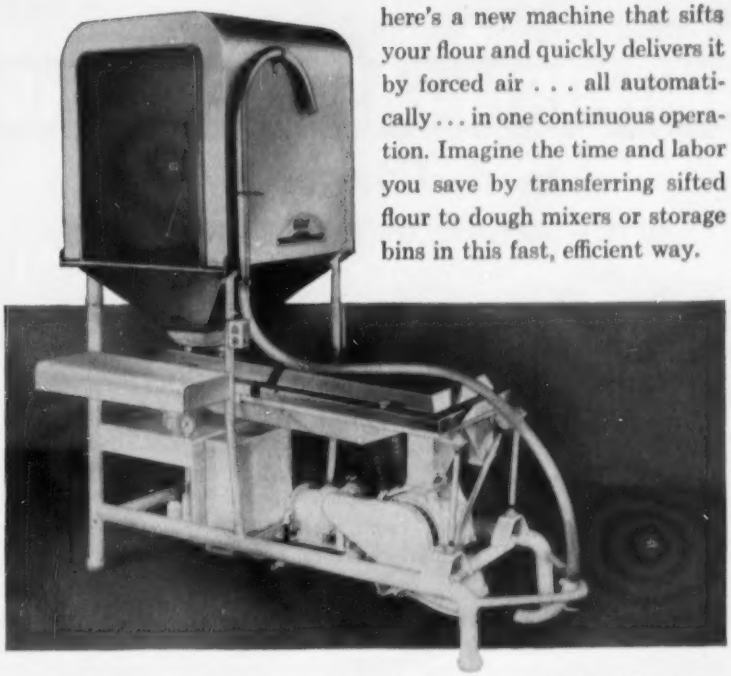
Containing detergents, and wetting and sequestering agents, material (Kaustik-Aide) extends the life of wash solutions, thereby increasing their efficiency and economy. Also, effective wetting action, which facilitates rapid draining of bottles, minimizes carry-over of solution from wash to rinse tanks to cut caustic consumption.—*Canton Chemical Corp., Wilmington, Del.*

Circle 129C on Reader Service Card

operation "airmatic" with the

DAY RO-BALL AIRMATIC...

here's a new machine that sifts your flour and quickly delivers it by forced air . . . all automatically . . . in one continuous operation. Imagine the time and labor you save by transferring sifted flour to dough mixers or storage bins in this fast, efficient way.



Flour is sifted in the popular Ro-Ball Sifter (one component of the Ro-Ball Airmatic) and is then blown to another point by a low-pressure air system, which requires only 4-12 psi and 10 cfm to convey 100 pounds of flour per minute. No objectionable dusting. Low air consumption permits use of your existing air lines. Sanitary construction throughout. For complete information write for Specification Sheet B-105RA.

FOUNDED 1857

in baking equipment **DAY** *means longer life span*

EXCLUSIVE SALES AND SERVICE REPRESENTATIVES
J. & J. VICARS LTD.
EARLESTOWN ENGLAND

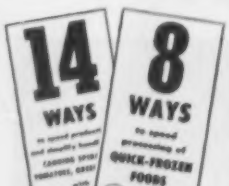
THE J. H. DAY COMPANY
1146 HARRISON AVENUE • CINCINNATI 22, OHIO
Quality equipment for baking, paint and varnish, printing ink, chemical, rubber, pharmaceutical, cosmetics, paper and pulp, explosives, food, ceramics, candy, soap, sugar and milk products.

Eastern Canada: Brantford Oven & Rack Co., Ltd., Brantford, Ontario
Mexico: T. de la Pena e Hijos, S.A., Nazas 45-A, Mexico 5—D.F.

UNIFORM FAST FREEZING

WITH *Cambridge*

WIRE MESH CONVEYOR BELTS



Regardless of what you're freezing, you'll get a more uniform product by washing, blanching, cooling and freezing at controlled speed on continuously moving wire mesh belts. Open mesh permits free circulation of steam for uniform blanching and cold air for faster freezing, provides rapid drainage of wash water and steam condensate. Write for these detailed discussions of how Cambridge Wire Mesh Conveyor Belts can speed production by minimizing manual handling.

No matter what food or process . . .

. . . canning, freezing, baking . . . meat, poultry, candy, fruit or produce . . . Cambridge Wire Mesh Conveyor Belts can reduce your operating costs and increase product quality by continuous uniform processing with reduced manual handling. Lifelong rust-protection, quick drainage of process solutions, lack of odor and freedom from contamination are only a few advantages. All-metal belt is impervious to damage from heat and cold. There are no sharp edges because Cambridge belts are woven from round wire.

Cambridge Wire Mesh Conveyor Belts are made in any size, mesh or weave, and from any metal or alloy. Special raised edges or cross-mounted flights are available to hold your product during movement.

Call in your Cambridge Field Engineer to discuss how you can cut food processing costs by continuous operation. You can rely on his advice. Write direct or look under "BELTING, Mechanical" in your classified telephone book.

ASK FOR FREE 130-PAGE REFERENCE MANUAL illustrating and describing wire mesh conveyor belts. Gives mesh specifications, design information and metallurgical data. Ask for Special Industry Folder on your operation.

The Cambridge Wire Cloth Co.

WIRE CLOTH | METAL CONVEYOR BELTS | SPECIAL METAL FABRICATIONS

DEPARTMENT Q, CAMBRIDGE 10, MARYLAND

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

Briefs . . .

A Soft, Non-Porous Rubber, which can be securely bonded to metal, absorbs vibration, dampens sound, and acts as an air-tight or water-tight gasket. Material can be used at temperatures to 200F.—*Roth Rubber Co., 1860 S. 54th Ave., Chicago 50.* (131A)

New Proportioning System electronically digitizes individual weighings, also records formulas and weighings on summary punch cards.—*Richardson Scale Co., Clifton, N. J.* (131B)

Redesigned Gelometer, accurate to ±1%, determines gel strength of gelatin, gelatin desserts, and starch dessert powders, also hardness of cake and bread.—*Precision Scientific Co., 3737 W. Cortland St., Chicago 47.* (131C)

Overhead Conveyor Chain employs nylon wheels for quiet operation, stainless-steel bearings for resistance to corrosion.—*Richards-Wilcox Mfg. Co., Materials Handling Div., Aurora, Ill.* (131D)

Multi-Unit Packager automatically wraps any size can in multiples of 2-6 per carton, single file. Other model handles 4-12 units per carton, double file. Machines occupy 2x4 ft., require one operator, and are leased.—*Atlanta Paper Co., 950 W. Marietta St., Atlanta 2.* (131E)

Frozen-Meat Cutter has adjustable hopper that quickly accommodates various-size blocks.—*H. G. Weber & Co., Kiel, Wis.* (131F)

Portable Moisture Meter analyzes liquids, solids, and gases without removing unit from its case. Instrument operates on 115-v. 60-cycle current, and has a range of a few parts per million of moisture to over 50%.—*Central Scientific Co., 1700 Irving Park Rd., Chicago.* (131G)

Pocket Refractometers cover the range 0-85% soluble solids with four models. Units are accurate to 0.1% and weigh 8 oz.—*Epic, Inc., 154 Nassau St., New York City 38.* (131H)

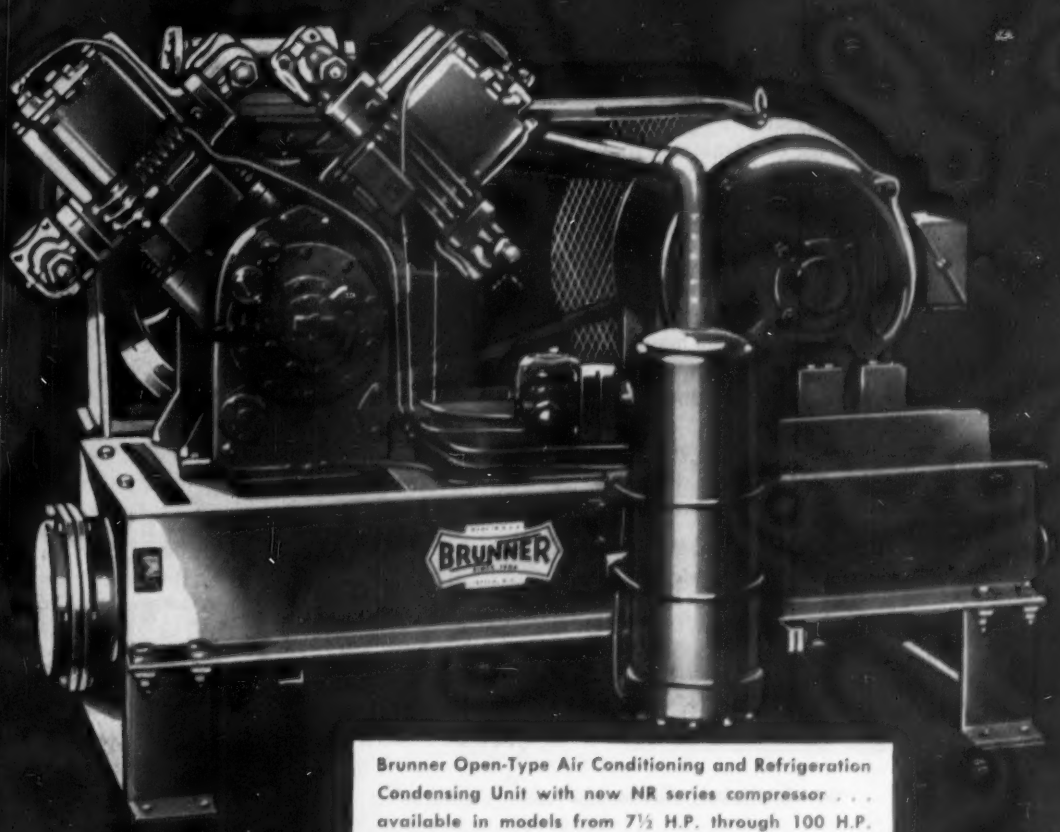
Portable Sanitizer uses plant water pressure to spray detergent solution on equipment, walls, and floors.—*Oakite Products, Inc., 19 Rector St., New York City 6.* (131I)

1906

TODAY

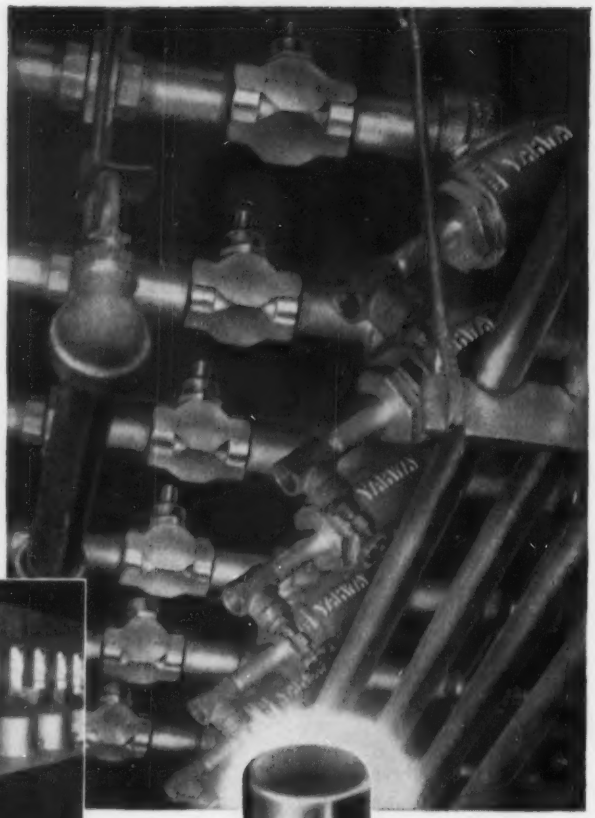
GO BRUNNER

50th Anniversary BRUNNER — PROVEN QUALITY DEPENDABLE



Brunner Open-Type Air Conditioning and Refrigeration Condensing Unit with new NR series compressor . . . available in models from 7½ H.P. through 100 H.P. Commercial units ¼ H.P. through 7½ H.P.

Ocean Spray cooks up more cranberry sauce profits with *Yarway Impulse Traps*



"Ocean Spray", a famous name in cranberry sauce and jelly, is now using *Yarway Impulse*, a famous name in steam traps, on jacketed cooking kettles at their Bordentown, N. J. plant.

Result—greater cooking efficiency, less down-time, and a bigger batch of profits.

Look at this list of advantages found in the YARWAY Impulse Steam Trap. See if *your* trapping installations would benefit from them:

- **Quick heat-up and even temperatures of equipment**
- **Good for all pressures without change of valve or seat**
- **Small size—light weight**
- **Only one moving part**
- **Stainless steel—minimum maintenance**
- **Won't freeze up**
- **A complete line of sizes and types for every requirement**
- **Immediately available from over 270 Industrial Distributors**

Write today for free Trap Catalog and Trap Selector.

YARNALL-WARING COMPANY
127 Mermaid Avenue, Philadelphia 18, Pa.

YARWAY

IMPULSE® STEAM TRAP

OVER 1,000,000 YARWAY IMPULSE STEAM TRAPS USED

Equipment Applications

Stream Pollution Curbed By Efficient Separator

This vibrating-screen separator has solved a stream-pollution problem at the shrimp-processing plant of Robinson Canning Co., Westwego, La. Furthermore, solids reclaimed from waste water are sold as fertilizer.

The 48-in. separator (Sweco, Southwestern Engineering Co., 4800 Santa Fe Ave., Los Angeles 58) was equipped with a 20-mesh stainless-steel screen cloth. It handles 800 gpm. of waste water containing shrimp hulls and heads discharged from automatic peeling machines. Feed pipe is 6-in. dia. and unit has two oversize discharge spouts.

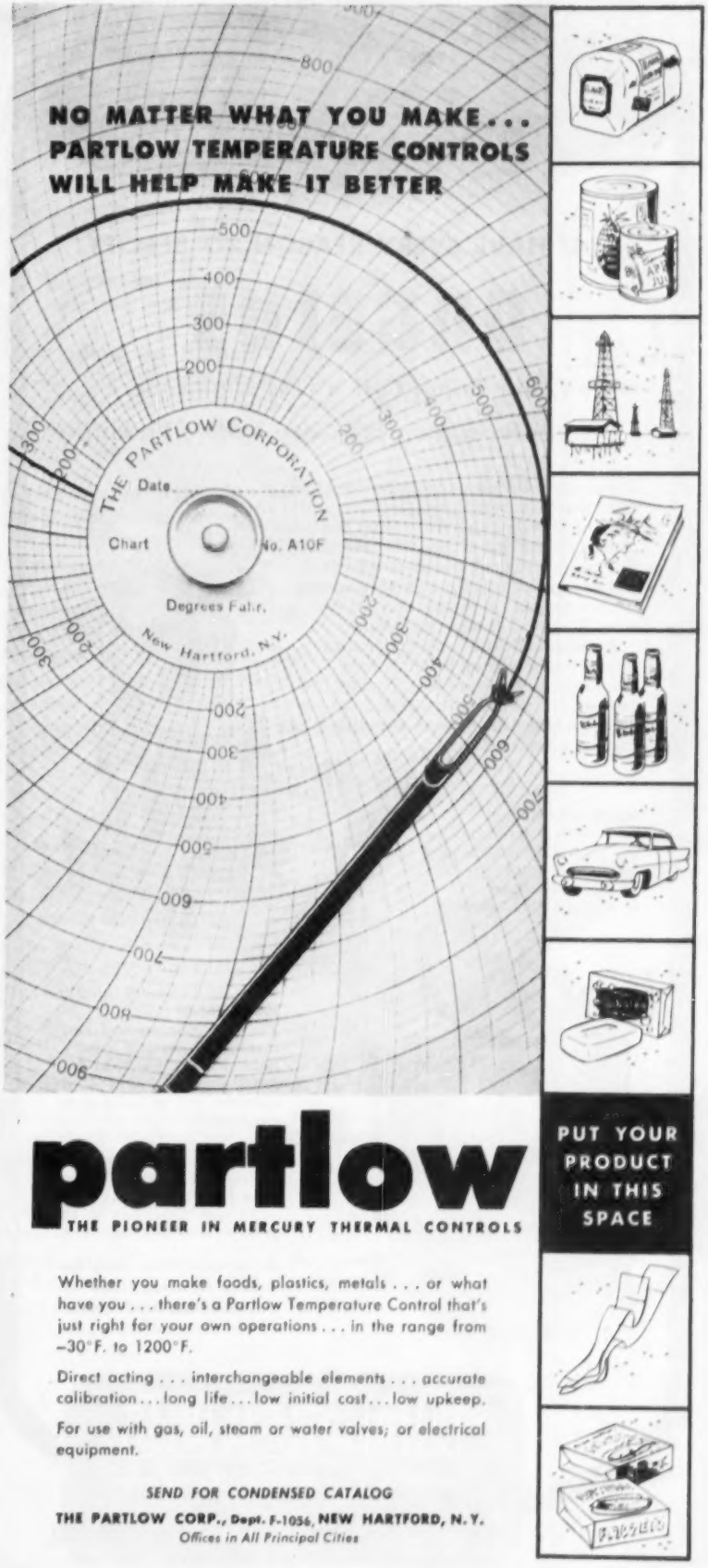
After dewatering, solids drop onto a 24-in. wire-belt conveyor which takes them to a drying oven. Clear waste water drains into a canal.

Circle 133A on Reader Service Card

Aluminum Cold Plates Up Truck's Payload

By using aluminum for eutectic cold plates of their 7-ton delivery trucks, Isaly Dairy Co., Pittsburgh, has saved about ½ ton of dead weight. In addition to boosting the payload, these units (Aluminum Co. of America, 1501 Alcoa Bldg., Pittsburgh 19) are expected to cut operating costs and improve sanitation.

Five plates were installed in the two-compartment vehicle. Three small ones were placed in the forward section to hold temperatures between 0 and 10F. for ice cream. Two larger units were bolted in the


NO MATTER WHAT YOU MAKE...
PARTLOW TEMPERATURE CONTROLS
WILL HELP MAKE IT BETTER
THE PARTLOW CORPORATION
Date
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Degrees Fahr.
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partlow
THE PIONEER IN MERCURY THERMAL CONTROLS
Whether you make foods, plastics, metals . . . or what have you . . . there's a Partlow Temperature Control that's just right for your own operations . . . in the range from –30°F. to 1200°F.
Direct acting . . . interchangeable elements . . . accurate calibration . . . long life . . . low initial cost . . . low upkeep.
For use with gas, oil, steam or water valves; or electrical equipment.
SEND FOR CONDENSED CATALOG
THE PARTLOW CORP., Dept. F-1056, NEW HARTFORD, N. Y.
Offices in All Principal Cities
PUT YOUR PRODUCT IN THIS SPACE

For more data, circle this page number on card at back →

FOR ROUND CAN CLOSING REQUIREMENTS

YOU HAVE EVERY REASON TO SPECIFY

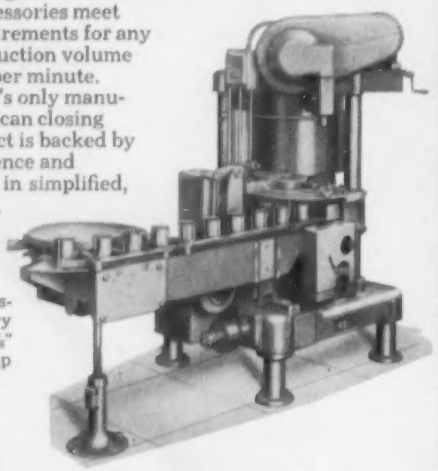
ANGELUS

• *Lower Initial Cost* • *Less Maintenance*

• *Greater Production Efficiency* • *More Versatility*

These are the reasons more canners and can manufacturers throughout the world are switching to Angelus Automatic Seamers. The complete line of Angelus Seamers with their wide range of accessories meet round can closing requirements for any type of product in production volume from 30 up to 500 cans per minute.

Angelus is the nation's only manufacturer specializing in can closing machines. Every product is backed by over 40 years of experience and represents the ultimate in simplified, rugged, efficient design.



MODEL 40P—MSLF
With chain feed for can closing only. Automatic Rotary Seamer for round cans 2⅛" to 4¼" in diameter and up to 275 cans per minute.

MODEL 40P-DF
For can closing and can making. Automatic Rotary Seamer with disc feed for round cans 2⅛" to 4¼" in diameter and up to 275 cans per minute.

Investigate the advantages of low cost production, low cost investment, and low cost maintenance with Angelus Automatic Seamers.

Write today for complete details on models and an Angelus Engineered Application Recommendation.

ANGELUS
Sanitary Can Machine Company
Cable Address "Angelmeco" Western Union Code
4900 Pacific Boulevard • Los Angeles 58, Calif.

Equipment Applications

rear area to keep other items at 40F.

Plates are filled with brine which is frozen solid as liquid ammonia is piped through. Hoses are disconnected at the start of the day and the truck is ready for use.

Circle 133B on Reader Service Card

Small Packaged Plant Cuts Icing Costs

Automatic production of flaked ice at Foremost-Golden State, Ventura, Calif., provides a dependable source of clean ice and cuts costs as well.

Employed is a small packaged plant available in daily capacities of 1,000-20,000 lb. (Moore & Hanks, 9702 Rush St., El Monte 5, Calif.). Units operate at the push of a button or a setting of an automatic clock. They may be leased, which frees working capital.

Circle 134A on Service Reader Card

Catalytic Purifiers Cut Lift-Truck Investment

By equipping their gasoline-powered lift trucks with catalytic purifiers, Apple Growers Assn., Hood River, Ore., can use the trucks inside their buildings as well as outside. Thus, a considerable saving in lift-truck investment is reported.

Purifiers (OCM Catalytic Exhaust, Oxy-Catalyst, Inc., Wayne, Pa.) replace standard mufflers on internal combustion engines. By catalytic action, they oxidize deadly carbon monoxide and hydrocarbons in exhaust gases to harmless carbon dioxide and water.

Circle 134B on Reader Service Card

Trucks Efficiently Chilled By Direct-Expansion NH_3

Cold plates of 40 refrigerated trucks at Koontz Creamery, Inc., Baltimore, are efficiently charged by direct-expansion ammonia.

As they return from their routes, trucks are plugged into liquid and suction lines. Liquid ammonia is pre-cooled in a central refrigeration system and feed is regulated by a thermal-expansion valve with strainer and bulb. System (Frick Co., Waynesboro, Pa.) chills the plates to 18F. for summer operation.

Circle 134C on Reader Service Card

Three food plant lube problems STANOIL Industrial Oil can help you whip

big maintenance headaches can end with switch to STANOIL

1. Poor flow of lubricant on cold start-up. STANOIL Industrial Oil, due to selective refining methods which remove waxy constituents and the use of special additives, has an exceptionally low pour point. STANOIL flows freely at low temperatures, is ready to lubricate at the instant of start-up. Candy, bakery and other food processing plants with intermittent production get full lubrication of equipment from start to stop.

2. Large inventory of special purpose lubricants. Versatile STANOIL gives top lubrication performance under a broad range of conditions...heat or cold, continuous or intermittent, high pressures and low. One oil for all applications eliminates special purpose oils, eliminates inventories of these oils, eliminates application mistakes.

3. Water contamination of lubricant. Cleaning of equipment and condensation mean water contamination of most oils with resulting water-oil emulsion. STANOIL has excellent demulsibility, is specially refined to eliminate emulsion problems, contains an additive which virtually eliminates foaming.

Check with your Standard Oil industrial lubrication specialist about converting your plant to STANOIL. There is one of these Standard men near you in any of the 15 Midwest and Rocky Mountain states. Call him or write Standard Oil Company, 910 S. Michigan Ave., Chicago 80, Illinois.

Quick Facts About STANOIL Industrial Oil

- **Stability.** STANOIL's antioxidant gives oil resistance to chemical change, minimizes deposits.
- **Rust Prevention.** Inhibitor in STANOIL "plates out" on metal surfaces, prevents corrosion.
- **Cold Starts.** STANOIL has low pour point. Flows freely from cold start. No need for costly warm ups.
- **Resists Effects of Temperature Change.** STANOIL has high viscosity index, is resistant to change in both high and low temperature service.
- **Excellent Demulsibility.** STANOIL is refined to eliminate emulsion problems, contains additive to minimize foaming.

STANDARD OIL COMPANY
(Indiana)

STANDARD

Maintenance engineering

You can arrange to have a Honeywell service engineer visit your plant at regular intervals to inspect, clean, and adjust your instruments and controls. He's factory-trained and field-experienced in keeping good instruments in top operating condition. If an emergency should arise, a phone call will bring a Honeywell service engineer to your plant in a hurry.

Spare parts, in a rush

A Honeywell branch office near you can be your storeroom for standard parts . . . in addition, the Parts Depot in Philadelphia carries a complete stock of all normally used parts. With Honeywell stocking your spare parts, you save storage and inventory control costs. Most shipments are made within 24 hours after orders are received.

Service is the

Practical service training

The tuition-free Honeywell Training School teaches your instrument technicians the most up-to-date maintenance methods, fits them for the kind of problems they may encounter on the job. Intensive courses range from two to fourteen weeks.

Application engineering

Experienced Honeywell application engineers know your industry and processes. They design *complete* systems of instrumentation, reducing the work of your own engineering staff. From the broad Honeywell line, they recommend instruments that are exactly right for the job. And because Honeywell supplies all types of instruments, recommendations are made without bias. Service engineers will, if needed, help with installation and startup of your system.

big extra you get with Honeywell instrumentation

Honeywell offers you far more than instruments. You get service whenever and wherever you need it . . . service that begins when you first decide you need instruments, and continues long after they're installed. This service is always conveniently close at hand, for there are more than 110 Honeywell sales and service centers located strategically throughout the U. S. and Canada.

Prompt, competent service by nearby field specialists is an important plus-value of Honeywell instrumentation. Your local Honeywell sales engineer has all the facts on this service as it relates to your instrumentation needs. Give him a call . . . he's as near as your phone.

MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, Wayne and Windrim Avenues, Philadelphia 44, Pa.—in Canada, Toronto 17, Ontario.

H HONEYWELL

MINNEAPOLIS-Honeywell

BROWN INSTRUMENTS

First in Controls

is FOAM your production BOTTLENECK?

use a Dow Corning silicone defoamer

most efficient, versatile and economical foam-killers known!

one ounce of

ANTIFOAM A — KILLS FOAM IN 35,000 lb. vitamin B_2

ANTIFOAM AF EMULSION — KILLS FOAM IN 250,000 lb. molasses

Break that bottleneck . . . speed processing . . . boost productive capacity . . . eliminate waste and fire hazard of boil-overs. Use a Dow Corning silicone defoamer!

It is now permissible to use Antifoam A Compound in processing nonstandardized foods at concentrations up to 10 ppm—water dilutable Antifoam AF Emulsion at concentrations up to 34 ppm.

***Free Sample**—make your own test—send coupon today*

DOW CORNING SILICONES

Dow Corning Corporation
Midland, Mich. Dept. 5510

Please send me:
FREE sample of ☐ Antifoam A Compound; or ☐ Antifoam AF Emulsion;
☐ Booklet on Silicone Defoamers.

NAME _____
COMPANY _____
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LETTERS TO THE EDITOR

Flavor Testers Often Use Wrong Techniques

Dear Sir:

I would like to add my comments on the article, "Flavor Evaluation Still Has a Long Way to Go," by Dr. J. W. Mitchell (FE July, p. 46).

Generally speaking, flavor evaluation by sensory techniques has come a long way. Valid procedures are available today which can be applied to almost any problem connected with flavor, provided they are applied correctly.

Perhaps the main trouble today is that too many researchers with inadequate background conduct sensory studies. They often use poor, or wrong, techniques that produce answers which cannot be substantiated later. These are then blamed on the procedures used.

Our experience has shown that only relatively large consumer groups can give a valid direct preference rating. No standard correlation coefficients (by which small panel ratings can be extrapolated to consumer group ratings) are generally available. Never should a small, trained sensory panel be used for direct preference tests. Such a panel, by its very nature, is an analytical tool and cannot give valid preference results.

There are, however, techniques by which a small trained panel can indirectly supply reliable preference ratings. These apply when you measure separately the sensations which combine to measure acceptance—texture, color, and flavor.

If a reference standard is available, a small trained panel can evaluate relative acceptability by a series of modified difference tests. Here, each sample is evaluated with respect to the standard, or by rating-scale tests in which the similarity of test samples to the standard is measured.

A second, and generally preferable, way to obtain preference data is by "flavor characterization" techniques. The over-all flavor is broken down into several characteristics, and each characteristic is rated by the trained panel according to its relative strength on a predetermined scale.

Thus, each test sample is characterized by an individual flavor pattern. The flavor pattern can then be used to reliably predict consumer acceptability in cases where sufficient auxiliary information on the factors influencing preference can be obtained.—*Kurt S. Konigsbacher, Evans Research & Development Corp., New York City.*

Off-Guard Taste Tests

Dear Sir:

Regarding your article, "Flavor Evaluation Still Has a Long Way to Go" (FE July, p. 46):

All that is usually expected of a test panel is to answer "Yes" or "No" to indicate which of two samples they like better. Very seldom is this of any help to the man responsible for production. He wants to know the reaction on the palate and throat. He wants to know: Is the flavor slow or fast? Is it smooth or rough? Does it clear the throat?

With answers to such questions, he then knows what to do.

A scorecard should check the reaction, not the ingredients or not necessarily the finished product. You need a "flow sheet" from the lips, to the throat, and back again. Then a product worthy of final testing can be created.

To test the product, a few simple rules qualify a tester:

1. He should not know he is testing.
2. He should like the type of product.
3. He should desire refreshment.

With a prospective taster at your desk and, say, an orange drink to be tested, ask these questions: "Do you like oranges?" "Will you have a drink with me?"

Both answers must be "Yes."

Talk about the ball game or the election, and watch his reaction to the drink. You gave him a very small glass. Ask him to have more. Take time to empty your own glass.

Then ask: "If you could buy such a product, would you take it to your home? If necessary, would you pay a little more for this than for X brand?"

Repeat this with as many as you wish.—*F. G. Schweizer, Aurora, Ill.*

About Rancidity

Dear Sir:

I read with much interest the article, "Which Antioxidants for Your Fat-Containing Foods?" by B. N. Stuckey (FE July, p. 76), and I should like a reprint.

There is, however, a slight error

IMITATION VANILLA BEAN FLAVOR BY FIRMENICH

Vanilla Bean Flavor by Firmenich stems from the vanilla bean. By original research, its components and desirable characteristics have been isolated, identified, and synthesized. By patient and painstaking laboratory techniques, they have been reconstructed for you in a precise and potent flavor material with all the aromatic qualities of the original. Vanilla Bean Flavor by Firmenich comes to you as an economical replacement of pure vanilla extract, of pure vanillin, or to use in combination in the manufacture of all products that you flavor with this most popular of flavors. Contains no coumarin.

FIRMENICH & CIE
SUCCESSEURS DE
CHUIT, NAEF & CIE.

FIRMENICH INCORPORATED

[illegible]

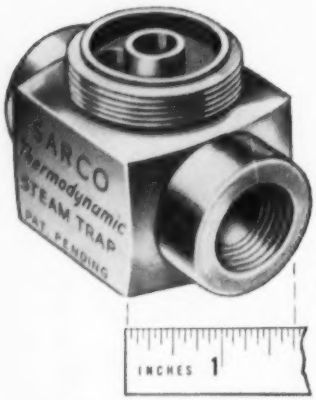
Now — A Revolutionary NEW Steam Trap!

What could be simpler?

1. A CAP

2. A DISC

3. A BODY



That's all!

Practically Eliminates Maintenance!

Look at this revolutionary new thermodynamic steam trap. Could it possibly be simpler? Look for the valve closing mechanism—there isn't any! The kinetic energy of steam closes the valve and *only* the TD uses this new operating principle.

Only 3 parts ... cap, disc and body ... machined from stainless steel bar stock ... all extremely simple, rugged, durable. Only one moving part ... a hardened SOLID stainless steel disc ... practically wear-proof.

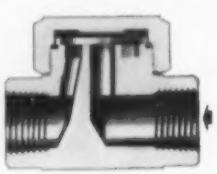
Just imagine how much time and expense this new TD steam trap can save you by greatly reducing and simplifying trap maintenance and inventory!

SOME OF MANY OTHER ADVANTAGES:

1. Use the same trap for 10-600 psi ... for light or heavy loads ... without seat or valve change or other adjustments.
2. Closes tight on no load — no steam waste.
3. Operates against back pressures up to 50% of inlet pressure.
4. Not affected by superheat, water-hammer, corrosive condensate.
5. Only one spare part—solid stainless steel disc.

TROUBLE-FREE DESIGN

No valve-closing mechanism to wear or stick — the kinetic energy of steam closes the valve. No critical clearances to choke. No gaskets to leak. Only one moving part—a SOLID stainless steel disc.



Ask for a 60 day trial installation of Sarco TD trap and strainer ... write for bulletin 257. Sarco Co., Inc., Empire State Bldg., New York 1, N. Y.

SARCO

2148-B

Only Sarco Makes All 5 Types

That's why Sarco can give impartial advice on proper steam trap selection.

Thermodynamic Steam Traps

Thermostatic Steam Traps

Float Thermostatic Steam Traps

Liquid Expansion Steam Traps

Camlift Bucket Steam Traps

in terminology in the article—on page 198, column 2, second paragraph. It states that "Hydrolytic rancidity is found in milk that has developed a cardboardy or oily flavor."

This is not correct, since cardboardy or oily flavor is the result of *oxidative* rancidity, *not* hydrolytic rancidity.

In the latter type of rancidity, the triglycerides are split into glycerine and free fatty acids which produce the typical butyric acid flavor and odor in rancid milk.

The dairy chemist hardly ever speaks of tallowiness or oiliness as rancidity, but reserves the term "rancidity" for hydrolysis or splitting of the fat, *i.e.*, hydrolytic rancidity.
—*J. G. Leeder, Professor of Dairy Industry, Rutgers University, New Brunswick, N. J.*

—*End*—

Freeze-Enzyme Peeling

—*Continued from page 59*

planes. The paddles form compartments in which the tomatoes ride.

As product passes through the unit, it is gently pressed by the movable, elastic planes. Friction frees the tomato from its peel.

Should there be points of greater resistance on the peel, caused by scars or green areas—the paddle rollers, which rotate on contact with the sides, pull off the partially detached skin.

Product then passes over a roller inspection table (7), where a few women trim any unpeeled spots. Tomatoes are filled on a hand-pack filler, exhausted in a tunnel, capped, and finally pass through a continuous cooker-cooler (Italian-made)—the entire operation being straight-line and continuous from start to finish.

A special waste conveyor (8) carries all skins to a crusher. Chopped waste is then fed to tomato paste kettles.

Refrigerating Units

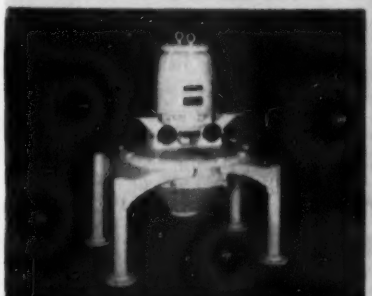
Brine for the freezer is chilled in a "packaged" refrigeration system (9) located under the intake roller-conveyor. It consists of an 85-hp. compressor, a multi-tube condenser, and an evaporator brine cooler (located in the brine tank).

The entire line consumes about 90 kw. of electric power, 900 lb. of steam, and 1,400 cu. ft. of water per hour.

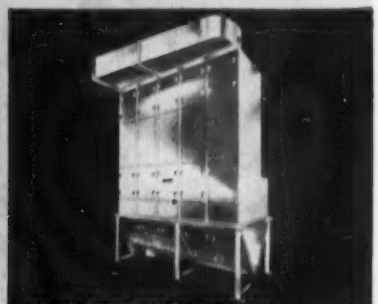
End (*Resume reading on page 60*)

ENTOLETER®
EQUIPMENT FOR...

- MIXING
- DISPERSION
- AIR SEPARATION
- PARTICLE SIZE REDUCTION
- PNEUMATIC CONVEYING
- DUST RECOVERY

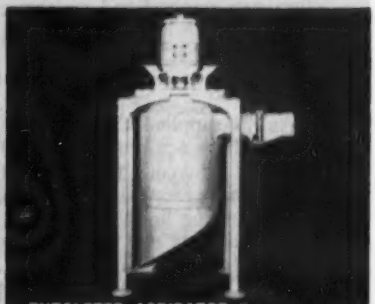


STANDARD ENTOLETER MIXER . . .
for complete dispersion of dissimilar, free-flowing solids . . . solid-liquid systems . . . liquids . . . at capacities to 8 tons per hour.

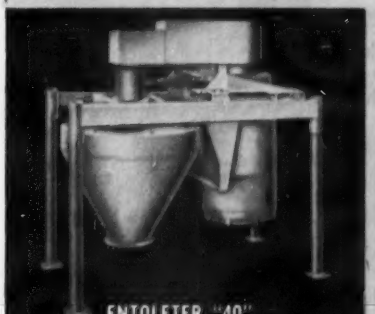


ENTOLETER-SIMON SUCTION FILTER DUST COLLECTOR . . .
the most economical, high efficiency dust recovery equipment.

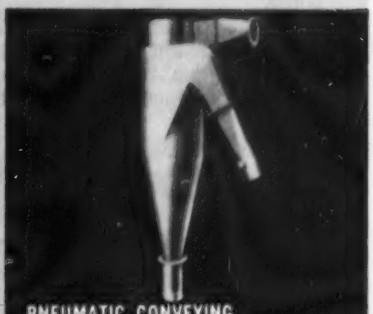
ENTOLETER IMPACT MILL . . .
for centrifugal mixing or particle size reduction with belt-driven, constant speed or variable speed drive . . . in capacities up to 60 tons per hour.



ENTOLETER ASPIRATOR . . .
for separation by air, of mixtures consisting of materials of varying density or air foil.



ENTOLETER "40" . . .
for grinding and particle size reduction applications with extreme impact velocities and/or capacities to 100 tons hourly.



PNEUMATIC CONVEYING . . .
simplicity of design, and choke-free operation and low power requirements assure continuous efficiency.

ENTOLETER DIVISION
SAFETY INDUSTRIES, INC.
Formerly The Safety Car Heating and Lighting Co., Inc.
P.O. Box 904 New Haven 4, Conn.

For more data, circle this page number on card at back →

NEW PACKAGES & PRODUCTS

Tailor-Made Bottle Caps

An aluminum screw-cap for milk bottles has been adopted at Sanitary Farms Dairy, Erie, Pa. Developed by Aluminum Corp. of America, the cap offers easy removal and replacement features to the housewife.

A slight twist removes the cap or replaces it, providing an effective and sanitary seal.

Foil is supplied to the dairy in small 15 lb. pre-printed coils of .0035 thickness. The coils are fed into the Alcoa Dairy Press, an integral part of the bottling line.

Formed caps are conveyed to a chute into the filling machine. As caps are placed on the bottle tops, sealing heads of the machine seal the caps to the bottles by squeezing with a rubber cup or sealing rubber. Each cap is thus tailor-made to the bottle.

The new closure gives high protection to the pouring lip of the bottle. True sanitation is assured because the deep cap covers most of the bottle neck.

Circle 142A on Reader Service Card

Auto-Capping Plastics

Reported as the first plastic lid for automatic capping of plastic containers is a new closure developed by Mutual Plastic Mold Co.

Made of high-impact polyethylene, the lid adds economy, speed, and efficiency to mechanical capping of plastic containers.

Circle 142B on Reader Service Card

No-Cook Puddings

Two new flavors, lemon and banana cream, have been added to the Jell-O instant pudding line. Both are suggested as "naturals" for processor's "Shake-A-Pudding" recipe.

The lemon flavor is reported as the first nationally distributed lemon flavored instant pudding. Consumer research tests have indicated that a good market exists.

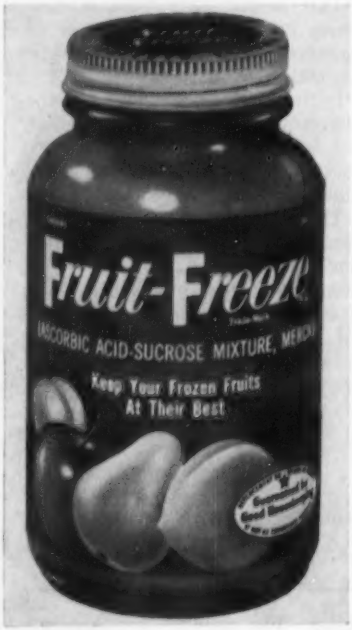
The "Shake-A-Pudding" idea is simplicity itself: a package of Jell-O instant pudding, shaken briskly for 1 min. with 1 pt. of cold milk, produces a smooth dessert that requires no cooking and sets in 5 min.

Reclosable Cannister

Designed to meet requirements of powder and granulated foods is Continental Can Co.'s new Savorlock can. Round, lock-type cans come in two consumer sizes, 204 x 315 and 305 x 507. Covers are fitted with a pulpboard liner and glassine seal.

Filling and capping is essentially the same as of glass jars.

Circle 142C on Reader Service Card



Guards Frozen Fruit Flavor

A combination of Vitamin C and sucrose which prevents discoloration of frozen fruits is being marketed nationally by Merck & Co., Rahway, N. J. The product is called Fruit-Freeze.

The protective mixture is added before freezing. It may be dissolved in syrup to make a solution into which the fruit is sliced. But it is equally effective when mixed with sugar or sprinkled over the fruit.

Fruit-Freeze is packed in 5 oz. bottles. Each bottle is reported sufficient for 75 lb. of fruit.

Circle 142D on Reader Service Card

King-Size Luncheon Meat

Reported as a "first" is John Morrell & Co.'s new 1 lb. can of luncheon meat. Produced at the firm's Ottuma, Iowa, and Sioux Falls, S. D., plants, the product has successfully completed market tests.

Containing 33% more meat than the standard Snack, the new size is aimed at meeting the demands of the larger family unit. It also emphasizes the "main dish" aspect of the product.

new idea in unit packaging...

NABISCO'S NEW LORNA DOONE PACKAGE CONSISTS OF TWO STANDARD SINGLE-UNIT CARTONS OVER-WRAPPED, EACH PROTECTED WITH AN INNER LINER OF RIEGEL'S WAXED GLASSINE.

By pairing two standard cartons in one outerwrap, Lorna Doone introduces a new large-size package that's easy to handle, keeps cookies fresh longer, and eliminates the need for extra machinery. To protect freshness, the individual boxes are lined with a special Riegel paper. Riegel can also protect the sales-winning qualities of your products . . . with important money savings . . . by creating the right combination of the most efficient packaging materials . . . and by "tailor-making" the paper to run and seal at high speeds on your machines. Write to Riegel Paper Corporation, Box 170, New York 17, N. Y.

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GLASSINES AND GREASEPROOFS
Plain • Waxed • Printed
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A Sweet Situation

FOR

VIKING PUMPS

In the Chicago area, liquid sugar is pumped largely with Viking Pumps. Inland Sugar Company of Chicago, which serves the entire middlewest, uses bronze-fitted Vikings to fill storage tanks. They've had 10 years trouble-free service. (One of Inland's Vikings is shown at top.)

Tank trucks, which transport syrup from Inland Sugar to customers, also use Vikings. (Note bottom picture). In addition, many candy manufacturers, soft-drink bottlers, bakeries, and other liquid sugar customers, use Viking Pumps in transferring and processing. Truly a sweet situation.

For information on Vikings, write for bulletin 565e.

VIKING PUMP CO.
Cedar Falls, Iowa, U.S.A.
In Canada, it's "***ROTO-KING***" pumps
SEE OUR CATALOG IN SWEETS

Quick-Frozen Chinese Dinner

Newest addition to the frozen Chinese food line of Temple Frosted Foods is a complete chow mein dinner. Packed in a foil tray, the meal includes egg roll, fried rice, and chow mein with chicken.

Cello-Wrapped Corn Cobs

Carl's Market, Chambersburg, Pa., has reported record corn on the cob sales with use of a simple and inexpensive packaging idea:

Six semi-husked and tip-trimmed ears are placed on an 8 x 11 in. blacking board and overwrapped with cellophane from American Viscose Corp. No label is used.

Circle 144A on Reader Service Card

De Luxe Pretzel Package

A Christmas gift pack of pretzels has been designed by Milprint, Inc., for American Cone and Pretzel Co., St. Louis. The pretzels are individually wrapped in gold foil bags, the color tying in with the Rold Gold label.

The foil keeps the pretzels fresh in addition to adding eye appeal. The envelopes are packed in a gold colored cannister, the lid of which can be re-used as a serving tray.

Dressed for the Oven

Ready for the oven are foil-wrapped potatoes distributed by Sanders-McKee Potato Chip Co. The potatoes are individually wrapped in a 10 in. sq. sheet of printed foil.

The potatoes were marketed after the processor found them too large for conversion to potato chips. They are sold institutionally but plans are underway for future retail grocery distribution.

Have a 'Smoke'

A new line of cigarettes and cigars marketed by Philadelphia Chewing Gum Co., Havertown, Pa., is guaranteed not to be habit forming. The "tobacco" is really bubble gum. Cigars are packaged 12 to a box. Cigarettes, in four flavors, are packaged 50 to a windowed carton.

Cook 'em in the Carton

You don't even have to unpack this frozen product to prepare it for the table. Just throw the whole box in the oven. Made by Robert Gair Co., the Sav-a-Pan box is foil lined to serve as a heating container.

The foil lining also protects the

How New Container raised sales 25% to 100%!

To increase his sales in today's highly, competitive market, a large fish stick processor wanted to offer a "built-in" packaging advantage for the consumers' convenience. So he called in Ekco-Alcoa Containers Inc.

After many experiments, our food technologists suggested a ridged bottom container.* The fish sticks, resting cross-wise on the ridges, brown on both sides at once, without turning. No transfer, no pans to wash, just heat and serve in the same container.

A new and ingenious die design by Ekco-Alcoa Containers made this ridged bottom container possible and practical.

The sales results: in side by side tests, without any promotion, the fish sticks in ridged aluminum foil packages by Ekco-Alcoa Containers outsold the processor's indentical product in conventional wax-wrapped cartons; raised sales from 25% to 100%!

For a sales-making package for your product, call Ekco-Alcoa Containers Inc. Choose from the largest line of stock rigid aluminum foil containers, or have a package engineered to fit your particular needs.

*Patent Pending

The Plus Container

trademark

EKCO-ALCOA CONTAINERS *Inc.*
Wheeling, Illinois

EKCO is the registered trademark of Ekco Products Company, ALCOA is the registered trademark of Aluminum Company of America. The corporate name and combination mark, EKCO-ALCOA, is used under license to the manufacturer by each of these companies.

SPECIAL STARCHES

FOR FROZEN FRUIT AND MEAT PIES

unaffected by freezing and thawing

—and they cook without masking of flavor, lumping or clouding the color of frozen fruit and meat pies.

Fruit fillings have sparkling clarity . . . full flavor . . . and an appetizing semblance of flow.

Meat gravies have creamy texture . . . smooth flow . . . and never an undertone of cereal taste.

Want proof? Let one of our food technologists suggest a Special Starch for use with your ingredients, processing methods and equipment.

National

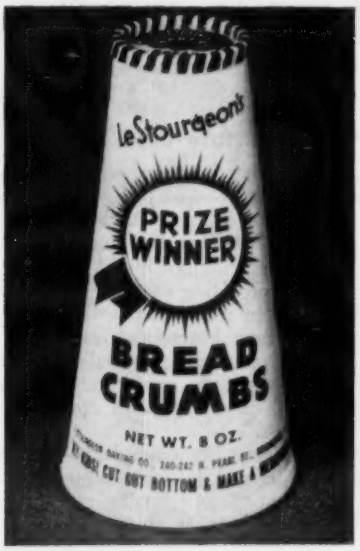
STARCH PRODUCTS INC.

270 Madison Avenue, New York 16 • 3641 So. Washtenaw Avenue, Chicago 32 • 735 Battery Street, San Francisco 11

← For more data, circle this page number on card at back

product (Western Taco Co.'s enchiladas and tacos, in this case) and prevents it from sticking in the carton.

Circle 144B on Reader Service Card



Crumbs in a Bottle

Three processors are using Sealright Kone Paper Bottles to package their bread crumbs. The 8 oz. bottles prevent crushing and guard against drying out or flavor loss. Users include Brown Berry Ovens, Costa Mesa, Calif.; LeStourgeon Baking Co., Bridgeton, New Hampshire; and Modern Bakery Co., Philadelphia.

Circle 147A on Reader Service Card

COFFEE BREAK MAKINGS for one are contained in a unique promotional gadget designed by Franklin C. Wertheim, Jamaica, N. Y. A standard pencil is topped by a transparent plastic tube containing enough instant coffee for one cup. The plastic may be imprinted with company name or a sales message.

Circle 147B on Reader Service Card

2 to 1

PREFERENCE

for *automatic* wrapping of

Frozen Products

FRIGIDINNER praises the adaptability and efficiency of their Hayssen Wrappers.

● A recent survey, made by one of the industry's largest national publications, revealed that Frozen Food Manufacturers use Hayssen Wrapping Machines by a margin of 2 to 1 over the nearest other make, and 4 to 1 over the next two. This overwhelming preference for Hayssen explains why it has become the standard of the industry. The Hayssen is completely automatic from the feed-in of the product to the ejection of the neatly, tightly overwrapped package ready for shipment. The Hayssen will wrap any size package in paper, film or foil, directly from roll stock with heat or glue seal. Let our packaging engineers help you with your packaging problems. WRITE US TODAY for further information.

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MANUFACTURING COMPANY

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What's the flavor of your food products? That's a hard question since flavor changes not only with the product, but also with each step in processing.

With this thought in mind, our research department conducts continuous, exacting tests of Victor Belting under actual operating conditions. Result: your guarantee of easily – yet completely – cleaned belting with no chance of residual food contamination or imparting of "belt-taste." That's why – with complete confidence – we recommend for *your* food handling:

VICTOR SUPRENE special-woven cotton duck belting thoroughly impregnated with an exclusive Neoprene compound. Water-proof, highly resistant to grease and most food chemicals, smooth-surfaced, and easily cleaned.

VICTOR 475 highest quality, solid-woven cotton belting impregnated and coated with a special Neoprene compound. Developed for use where laboratory cleanliness is a *must*. Washable with hot water or steam. Resists rancidity and deterioration.

A COMPLETE LINE including: • Hycar Belting • Neoprene Belting • Balata Belting • Solid-Woven Belting – Untreated, impregnated, coated – many widths and plies • Canvas Stitched Belting • Belting Specialties

Victor
Balata & Textile Belting Co.
53 Park Pl., N.Y. 7 • 332 S. W. Robbins St., Chicago 10
Factory: Boston, Pa.

Recloseable Tea Carton

Produced by Robert Gair Co. is a new carton for tea bags with a convenient reclosing device.

Currently used by John H. Wilkins Co., of Washington, D. C., the one-piece carton is glued in panels, one of which is perforated to form a reclosing device after the carton is open. Top slots of panel can be tucked into a die cut opening in the lower flap.

Circle 148A on Reader Service Card

Butter-Spiked Oleo

Introduced recently by Lever Bros. is Imperial margarine which boasts butter as one of its ingredients. The 1 lb. portion also contains vegetable oil and skim milk.

Convertible Candy Carton

Easily converted to a self-service counter display basket is the new carton used by New England Confectionery Co., Cambridge, Mass. A patented product, the carton is colorful and compact and spurs impulse buying.

Carton side panels can be extended outward to form a basket display. Unusual construction enables Necco to pack two filled cartons in a shipping sleeve. Retailer need only slide the carton out of the sleeve, raise a display card and pull side panels outward to set up the basket.

The display carton replaces a metal rack which the retailer had to fill and which did not give the manufacturer adequate brand identification.

—End—

New Lactose Uses

—Continued from page 57

tissues by using in cures along with glucose up to maximum amount of sugar permitted by BAI.

. . . **providing nutritive benefits** in cereals, by coating them with a syrup made from lactose and honey.

. . . **controlling crystallization** of other sugars in confectionery items such as caramels, fudges, creams, and fondant.

Fudges, for example, could be shock-cooled to force sugar crystallization. "Seed crystallizing," in this case, would retard "graining out" and produce smaller and smoother tasting sugar crystals. Second effect would be to extend shelf-life.

How It's Made

Lactos is commercially obtained by crystallization from concentrated whey (see FE June, p. 74). Crystals are further refined into food-usable edible and U.S.P. grades.

Briefly, here are the step-by-step processing methods carried out by Western Condensing at it's Appleton, Wis., plant.

Liquid whey (6.5-6.8% solids) is pumped through tubular-type preheaters and an up-blast 4-effect evaporator and concentrated to 28-30% solids. Along with condensed whey (35-40% solids) from feeder plants, it is pumped through still other tubular-type heat-exchangers and a single-effect evaporator and concentrated to about 50% solids.

Concentrate is charged into stainless, agitator-equipped tanks with cooling coils, where lactose is crystallized by a precise cooling technique. Then slurry is centrifuged, and crystals continuously washed until effluent water is crystal clear.

Crystals are now fed into a tray-dryer, emerging 97½% pure. They are then water-dissolved in a stainless, hot-water jacketed, agitator-equipped tank. Activated charcoal is added to decolorize the solution.

Product is now given a rough and a polishing filtration before being concentrated in a multiple-effect evaporator. It is then cooled, with

CONTINENTAL *Landmarks*

Periodic progress reports of interest and value to the packing field

New Savorlock cans for hygroscopic products combine long shelf life and positive reseal

Intended to spur impulse sales of instant coffee and other "hard-to-hold" products, Continental's newly announced Savorlock cans are believed to be the first of their category to be made on high-speed lines for maximum economy.

Eye appeal is provided by brilliant lithography, plus unusual package proportions, established on the recommendation of a well-known industrial designing firm. The two sizes – 204 x 315 and 305 x 507 – are pleasing in appearance, while getting as many units as possible into each running foot of shelf space. Additionally, the lightweight cans stack securely.

Intensive store evaluations show no appreciable moisture pickup four months after stocking. After tamper-proof glassine inner seal is broken, the lock top gives a positive reseal in day-to-day home use.

Supermarket time studies reveal it takes a shopper an average of 4 seconds to choose an item from a grocery shelf. New Savorlock cans, in 2 and 6-oz. capacity, are specifically designed for today's impulse buying.

PERTINENT DATA ON THE NEW Savorlock CANS

The full opening and positive resealing features recommend Savorlock for almost any powdered or granulated product, food or non-food. Evaluations have been confined to instant coffee as being one of the most hygroscopic of food products now marketed. Other products for which tests can be arranged include:

- Soluble tea and tea bags
- Chocolate and cocoa
- Non-fat dry milk
- Dehydrated soups
- Prepared chocolate mix
- Baking powder and soda
- Spices
- Vegetable flakes
- Brown and confectionery sugar
- Peanut butter
- Pharmaceuticals
- Laundry starch, bleach

Also instant gravy mix, bouillon cubes, powdered egg whites, dry coconut, prepared dips for fried foods, bread crumbs, hard candy, cookies, dessert powders, dry rice, instant potatoes, etc.

CONTINENTAL CAN COMPANY

Eastern Division: 100 E. 42nd St., New York 17
Central Division: 135 So. La Salle St., Chicago 3
Pacific Division: Russ Building, San Francisco 4
Canadian Division: 5595 Pare St., Montreal, Que.

"THIS LUBRICANT INCREASED BEARING LIFE FROM 2 WEEKS TO 2 YEARS"

—says THE GLOBE COMPANY

"Animal acids and moisture, most harmful to ball and roller bearings prevails in the entire meat packing industry. With conventional lubricants, some of the bearings in our Roto-Cut machines did not last two weeks. Since using Ball Bearing LUBRIPLATE in machines operating continuously 24 hours a day for over two years, we have not had a single bearing replacement."

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE

LUBRIPLATE LUBRICATION

MAKES CARS AND TRUCKS RUN BETTER AND LAST LONGER

LUBRIPLATE H.D.S. MOTOR OIL . . . THE OIL THAT NEEDS NO ADDITIVES

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK" . . . a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.

agitaion, in a cold-water jacketed, stainless steel tank.

At this point, processing varies, depending upon whether edible or U.S.P. lactose is to be produced.

For the former, concentrate is pumped to a spray dryer, and the dried product is bulk-packed, 100-lb. to a polyethylene lined, multiwall paper bag.

For U.S.P. grade, concentrate is charged into centrifuges, washed, and fed to the tray dryer. Crystals then proceed through a hammermill-type pulverizer before being packed 200 lb. in "poly"-lined fiberboard drums or 100-lb. in multiwall paper bags.

Quality, through all stages of processing, is laboratory-checked for ash, moisture, acidity, particle size, color, flavor, odor, bacteria, and extraneous matter.

End (*Resume reading on page 58*)

Flexible Film Solutions

—*Continued from page 55*

bination of ½-mil Mylar polyester film and 4-mil polyethylene have produced tensile breaks at stresses of 16 lb. per in. of width before any peel of the seal occurred. This strength corresponds to the calculated tensile strength of the combined film.

Now let us superimpose the Saran chart on the chart for Mylar polyester film (Fig. 2). This combination exhibits adequate strength and shelf life. The low temperature durability of Saran is enhanced by the supporting Mylar, and the high temperature durability (actually quite satisfactory in the case of Saran) is complemented to some extent.

Films Complement Each Other

The relatively high linear coefficient of expansion of Saran is controlled to improve dimensional stability. And Saran imparts heat sealability to the Mylar and markedly reduces the gas and moisture vapor permeability.

As in the case of polyethylene, Saran can be applied to Mylar polyester film as a lamination or as a coating. Du Pont is evaluating an experimental film based on 50-gage Mylar coated on both sides with a vinylidene chloride copolymer. It is heat sealable, forming seals of peel strength in the range of 300-400 grams/1.5 in. of width. Moisture vapor permeability is about one-fourth that of 50-gage Mylar alone, while permeability to gases is about 1/25th that of Mylar. It is operable on a number of conventional bag-machines, and forms bags having unusually high durability even at low temperature and low humidity.

Tests indicate that bags of this film are adequate for as much as 5 lb. of flowable product.

The combination of Mylar polyester film and vinyl (Fig. 3) is not made commercially, to our knowledge. Presumably, the combination does not provide a balance of properties well suited to a package application involving a sizable volume of film.

This may appear somewhat surprising; for our composite graph shows a combination of good strength, durability over a broad temperature range, and excellent heat seal. Gas and moisture permeability, and transparency, are not outstanding. But they still appear to be an acceptable range.

A composite film of this type might prove as well-suited as Mylar-polyethylene for packaging products requiring a high degree of durability.

Mylar polyester film may be combined with kraft paper (Fig. 4) to overcome low abrasion resistance and low wet strength, as well as to impart grease resistance. But the combination is still lacking in heat seal ability. And it is entirely dependent on the Mylar for gas and moisture vapor impermeability.

Nevertheless, this combination could serve a useful purpose as an overwrap for packages that may be subjected to abuse in handling and prolonged storage. Durability at high humidity is markedly enhanced over kraft paper alone, and the Mylar affords a moderate degree of moisture protection to the product.

Mylar-Foil Tops

Combinations of Mylar polyester film and aluminum foil are opaque. But for the ultimate in product protection against entrance or loss of any gaseous material, the combination stands alone.

Mylar provides strength and durability, particularly with respect to flex resistance and impact resistance (Fig. 5). With the exception of certain strong alkalis and acids, the combination is entirely resistant to common solvents, oils, and greases.

Aluminum foil, when free of microscopic deformities, is conceded to have zero moisture permeability. And it is not unusual to find 0.7-mil foil entirely free of such fissures, and entirely impermeabile to moisture.

Among flexible films, Mylar stands fairly high as a moisture barrier. So the combination—in which Mylar minimizes the formation of ruptures

in the foil—is believed to be the ultimate in moisture-vaporpoof flexible films.

And here is a surprising fact: Although neither component alone is rated high in heat sealability the composite is given a rather high rating. It turns out that film-to-film seals can be formed on conventional sealing equipment if the Mylar is backed with foil. This is an unexpected property that could not be predicted merely by superimposing one graph upon the other.

There is a complication with this structure, however, in the matter of pouch design. If a pouch were fabricated with the foil layer outside, the closures could be made by conventional heal seals—but the foil would be exposed to rupture by abrasion. If the pouch is fabricated with foil on the inside for protection, then the combination is no longer amendable to heat sealing by the ordinary fin sealers.

This dilemma can be circumvented through the use of adhesives or by formation of a 3-ply structure comprising Mylar polyester film, foil, and polyethylene. In the latter case foil would act solely as barrier.

Mylar-Metal Applications

There are two interesting items involving the combination of Mylar with metal as a rigid structure. One concerns combining Mylar and tinplate can as aerosol dispensers. Final figure shows two possible constructions—namely, that products dispensable by Freon propellants be entirely segregated from direct admixture with gas by a pouch of Mylar.

With this technique the undesirable foaming or spraying is eliminated, and the Freon exerts a constant pressure until the product is completely exhausted.

The other novel prospect involves a combination of Mylar with a rigid metal can. But it depends primarily on the flexibility of the film for utility. This is a liquid dispenser designed to emit a measured volume of liquid on inversion. The bottom of the can is perforated to admit air, but is covered with a disk of Mylar which expands into the can as the liquid product flows from the nozzle.

When the disk is fully expanded, flow is arrested, and thus by proper adjustment of the size, a predetermined quantity of liquid is dispensed.

Based on paper presented at Packaging Institute's recent 18th Annual Forum, in Cleveland.

End *(Resume reading on page 56)*

New types of Patapar® break records for GREASE-PROOFNESS

New types of grease-proof Patapar Vegetable Parchment offer a revolutionary way to package products having internal, or surface content of grease, fats, oils. These special lightweight Patapars provide positive resistance to penetration. They completely prevent grease crawl and stop all tendency of wetting by oils.

The effectiveness of the new grease-proof Patapars has been proven in packaging lard, hams, bacon, shortening, margarine, oiled machine parts and many other products. They are recommended as inner liners for multiwall bags, laminated cartons and spiral wound tubes for shipping oily materials.

High WET-STRENGTH, Too

Where there is grease, there is usually *moisture*. The special grease-proof Patapars have the answer for that, too. They have the same high wet-strength that is inherent in all the many different types of Patapar Vegetable Parchment. *This wet-strength is sure and permanent.*

LET US SEND YOU SAMPLES. Tell us the application you have in mind and we will send a brochure of testing samples together with technical information.

Write today.

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Vegetable Parchment
HI-WET-STRENGTH · GREASE-RESISTING

HEADQUARTERS FOR VEGETABLE PARCHMENT SINCE 1885

For more data, circle this page number on card at back →

Using Salt Efficiently

by **INTERNATIONAL SALT COMPANY, INC.**—America's largest producer of salt

You Can Save Money on Water Softening—With a "Lixator"

Today, a great many companies using zeolite water softeners are faced with this problem: While the water softener (which needs periodic regeneration with brine) gives excellent performance—regeneration is often costly, time-consuming, and causes substantial waste of salt. This is generally the case when salt is dissolved to form brine without the proper controls.

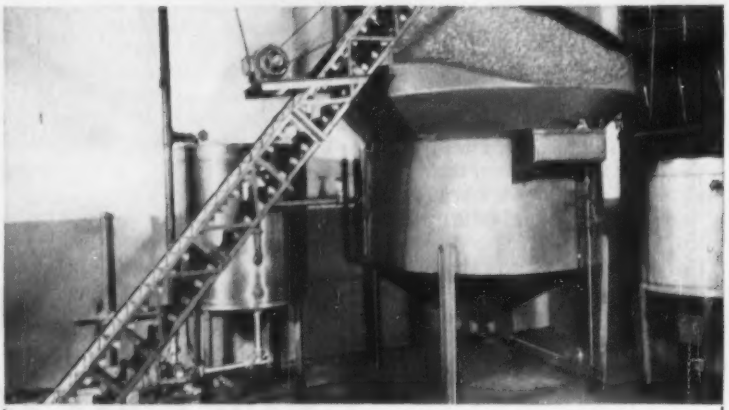
In most plants, however, it *is* possible to reduce this high cost of water-softener regeneration. The method is simple and effective: Always regenerate with pure, fully saturated brine—the type of brine made in a Sterling Lixator. Here are some of the reasons why Lixate Brine can save money for users of zeolite water softeners . . .

The Sterling Model Lixator is the most efficient and economical rock-salt dissolver ever developed. Wherever this fully automatic unit is used in water softening, it reduces the amount of salt consumed . . . eliminates dry-salt spillage . . . and simplifies the entire brine-making process. Developed and patented by the International Salt Co., the Lixator combines rock-salt dissolving and brine filtration in one simple operation. It delivers fully saturated crystal-clear brine *automatically* to any point within a plant. The Lixator is also remarkably easy to maintain, and has no moving parts to get out of order.

In operation, a Lixator need not replace the salt-dissolving tanks furnished by water-softener manufacturers. Instead, Lixate Brine is piped to these tanks—which then serve as the storage and measuring tanks from which brine is withdrawn for use.

Salt handling reduced. Because Lixate Brine is *piped* to points of use, the work of hauling dry salt from storage piles to the location of the water softeners is eliminated. Also, because of this direct-piping feature, the Lixator (and the salt that feeds it) can be placed anywhere in the plant, to make the most efficient use of available space. With a self-feeding hopper for salt, the Lixator operates automatically, without attention, and with little or no salt handling.

Lixators are made in a variety of types and sizes— to meet the brine needs of individual plants. The principle by which they operate can benefit the largest factory, or even a plant of moderate size.



At the Libby, McNeill & Libby plant in Hartford, Wisconsin, this Sterling Model Lixator is used for efficient, low-cost water-softener regeneration. A mechanical conveyor fills the Lixator hopper from a nearby rock-salt storage pile. In *your* plant, a Lixator can also produce substantial savings on salt—and in salt handling as well.

Complete regeneration. Since Lixate Brine is always 100% saturated, it provides complete water-softener regeneration each time. This means that extra regenerations—with the consequent use of more salt—are eliminated. Still another advantage results from using Lixate Brine: Water-softener operators will not use any more of this brine than is needed for each regeneration. What often happens in the case of unsaturated brine is that excess amounts are used in an attempt at complete regeneration. In the long run, this always results in a costly waste of salt.

Keeps water softeners clean. Besides being fully saturated, Lixator Brine—produced in a Lixator from economical grades of Sterling Rock Salt—is also self-filtered, and free from insolubles or other foreign matter. As a result, it will not introduce dirt or other "clogging material" into the zeolite bed of the water softener. This has proved to be a particular advantage in industrial water softening—because the zeolite stays in good condition longer. Lixate Brine is also free from acids or alkalies. Thus, being neutral, it cannot adversely affect the performance of any zeolite water-softening system.

TECHNICAL SERVICE WITH YOUR SALT

Through skilled and experienced "Salt Specialists," International can help you get greater efficiency and economy from the salt you use. International produces both Sterling Evaporated and Sterling Rock Salt in all types and sizes. And we also make automatic dissolvers in metal or plastic for both kinds of salt. So we can recommend the type and size of salt most perfectly suited to your needs.

If you'd like the assistance of an International "Salt Specialist" on any problem concerning salt or brine—or further information on water-softener regeneration—just contact your nearest International sales office.

International Salt Co., Scranton, Pa.

Sales Offices: Atlanta, Ga.; Chicago, Ill.; New Orleans, La.; Baltimore, Md.; Boston, Mass.; Detroit, Mich.; St. Louis, Mo.; Newark, N. J.; Buffalo, N. Y.; New York, N. Y.; Cincinnati, O.; Cleveland, O.; Philadelphia, Pa., Pittsburgh, Pa., and Richmond, Va.

FOR INDUSTRY, FARM, AND THE HOME—

STERLING SALT

PRODUCT OF INTERNATIONAL SALT CO., INC.

ADVANCES IN TECHNOLOGY

Maple Syrup Flavor, Color Effected by Fermentation

Improvement in the flavor and color of maple syrup may be brought about by controlled fermentation. If uncontrolled, however, especially at warmer temperatures, a dark-colored, strong-flavored product will result.

This was indicated by studies of microbiology of maple sap conducted at ERRL. Used were various bacteria and yeasts isolated from naturally contaminated sap.

Some of the organisms were found to enhance the flavor of the syrup with a minimum change in color. Others caused an increase in color without impairment of flavor.

Fermentations with yeasts or other saccharolytic organisms resulted in strong-flavored syrups characteristic of the darker grades obtained late in the season. Color and flavor changes were correlated with production of reducing sugars.—Paper by L. L. Reed at ACS meeting, Atlantic City, N. J., Sept. 17, 1956.

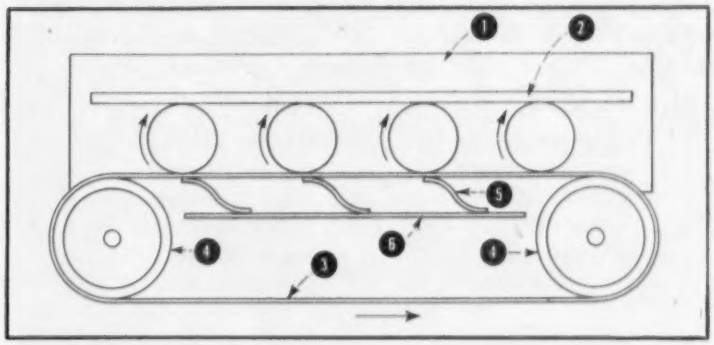
Food Packed By Volume Well Received in Norway

To test consumer's and retailer's reactions to volume packaging of solid foods, an extensive sales experiment has been conducted by the Norwegian Industries Development Assn., Oslo.

Granulated sugar, wheat flour, potato flour, groats, and rice were packed in 5 paper bags of same size but containing 1,000, 900, 900, 600, and 1,100g., respectively.

During a 4-week period, 50,000 such bags were sold in 8 self-service and 6 ordinary stores, in competition with bags of these products packed according to weight. Weight and price of contents, and corresponding price per kg. were printed on the volume-packed bags.

The volume-packed products took 25% of total turnover of granulated sugar and wheat flour, 50% of groats and potato flour, and about 60% of rice. Reaction of proprietors and employees in stores was usually favorable.—*Technical Digest No.* 823, European Productivity Agency (Paris), Aug. 1956.



Sterilizing Lid Seams With Direct Heat Enables Lower Temperature Canning

To insure sterility of double-seamed portion of lid end of cans filled with hot food, equipment has been patented that applies heat directly to the seam.

Temperature of seam is thus quickly increased without appreciable increase in temperature of can contents, and with consequent reduction in holding time required to sterilize the can.

In practice, cans are filled and seamed at product temperature high enough to insure sterilization of their inner surfaces. Then they are passed through a conventional inverter which turns the sealed cans through 180 deg. and guides them to hot plate (1 in diagram above), maintained at a minimum temperature of 250F. Due to the construction of sanitary type cans, only the lid seam will contact surface of hot plate.

Inverted cans are moved along hot plate between guide rail (2) and endless conveyor belt (3) which is supported on pulleys (4) and driven by one of the pulleys. Belt is maintained in close contact with cans by means of springs (5) mounted on rigid plate (6).

Cans are rotated as they slide along the hot plate by means of the driven belt. This sliding, rotating contact tends to keep plate clean and prevents accumulation of burned food that would interfere with heat transfer to the cans.

After a can has traversed length of hot plate it is conveyed directly to cooling chamber so contents can be quickly cooled.—U. S. Patent 2,748,005, May 29, 1956.

Automation Is Approached In Milk Receiving System

Most nearly automatic of the many European developed milk receiving systems is the one recently installed in Apeldoorn Co-operative Dairy in the Netherlands.

Capable of dumping 900 cans/hr. with one operator, the equipment comprises: (1) Scales with 2 weigh tanks and an automatic printing device; (2) mechanical tipper in the form of a wheel with 3 cradles; (3) one can capacity chute fitted with stop valve; (4) can washer with intermittent drive; (5) automatic sampler with sampling tanks and cooling cabinet; (6) electrically and pneumatically operated control panel, and (7) conveyor system for transport of cans.

For successful operation it is necessary to place full cans on feed conveyor according to current number of shippers, and in the same order every day. Full cans move to tripper on short conveyor which is synchronized with it. Tripper, in turn, is driven by can washer. Here cans are engaged by one of the

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the *pioneer* standardized invert sugar

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Retained moisture . . . one of the most valuable ingredients in food products . . . is the symbol and substance of freshness.

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. . . attracts and retains moisture	baked products . . .
. . . controls crystallization	candies . . . beverages . . .
. . . retards fermentation and molds	icings . . . toppings . . .
. . . counteracts shrinkage	concentrated syrups . . .
. . . improves taste and flavor	processed foods . . .
. . . enhances appearance.	frozen desserts.

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Manufacturers of NULOMOLINE (Standardized Invert Sugar) and Syrups

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Aerial view of our Plant No. 1, Brooklyn, N. Y.

cradles, inverted and emptied into chute at rate of 1 every 3 sec. Emptied cans are placed on draining section and move into washer.

As soon as milk from last can of one shipper flows from chute, stop valve automatically closes while chute swings over to empty weigh tank. Then valve opens enabling can dumping to proceed without stopping. In the meantime, weight of milk in first weigh tank is recorded, then tank is tipped and its contents emptied into sampling tank below. Here milk is stirred, automatically sampled, then quickly discharged through large outlet.

Swinging of chute, weighing, tipping of weigh tank, opening of valves and sampling are electrically controlled. In case of a disturbance in the weighing procedure, supply of full cans to tipper is automatically stopped.

First can of a shipper is equipped with a rubber ring. If he has more than one can, operator turns dial on control panel to number in particular batch. Once set, controls will not permit weighing until all of the individual shipper's cans are emptied.

Weight is shown on screen in control room and printed on receiving register beside name of shipper and date. Register is moved forward automatically after each weighing. If a shipper does not deliver milk the register and sampler must be moved forward manually by means of a correction button. System is fully automatic when shipper has only one can.—*Milkerei-und Kaeserei-Zeitung* (Hildesheim, Germany), 7 (19), 595, 1956.

Concentrated Ice Cream Mix

Preparation of a high-solids fluid ice cream concentrate from which lactose will not crystallize is accomplished by a patented process in which a large part of the lactose is hydrolyzed to simple sugars, including glucose and galactose.

Hydrolysis results largely from the action of a lactase enzyme preparation which is added to the milk product and which hydrolyzes at least 40% of the lactose.

In a typical application, raw whole milk is flash pasteurized and condensed to a 40% solids content. The condensed milk is heated to 160 F. for 30 min. and then tempered to 123 F. Yeast lactase, prepared as directed, is added in a ratio of one part by weight lactase to 50 parts by weight of lactose in the condensed milk. This mixture is

held at 123 F. for 4 hrs., at the end of which time 80-90% of the lactose has been hydrolyzed. Enzyme is inactivated by heating condensed to 160 F. for 30 min. and cooling to 40 F.

This product is blended with cream, sugar, stabilizer, and water to form a mixture containing 12% fat, 10.5% milk-solids-not-fat, and 15.5% sugar comprising a mixture of corn sugar and sucrose. Stabilizer comprises 0.015% gelatin and 0.05% polyoxyethylene sorbitan monostearate.

Mix is pasteurized, homogenized, and concentrated under vacuum to a solids content of 65%. It is then packaged in sealed cans or jars and stored at 40 F.

When mixed with an equal volume of water and frozen by a conventional method, the mix yields an ice cream indistinguishable from one made from unconcentrated ingredients.—U. S. Patent 2,738,279, March 13, 1956.

Test for Benzoic Acid In Margarine

A simple, rapid, and reliable colorimetric method for the determination of benzoic acid in margarine has been developed at QMF&CI, Chicago.

The margarine is acidified and extracted with ether. Then the benzoic acid is separated from the ether layer with 10% aqueous pyridine and made to react with $CuSO_4$ to form a Cu-pyridine-benzoic acid complex according to the method of Lapiere. This is extracted with chloroform and measured photometrically at 660 μ.

The advantages of this method over distillation, titration, diazotization, and ultraviolet absorption are: Speed, non-critical temperature requirements, and no need for an ultraviolet spectrophotometer.—Paper by Margaret G. Driver at ACS meeting, Atlantic City, N. J., Sept. 17, 1956.

Biological Properties of Cl_2O_2 Treated Flours

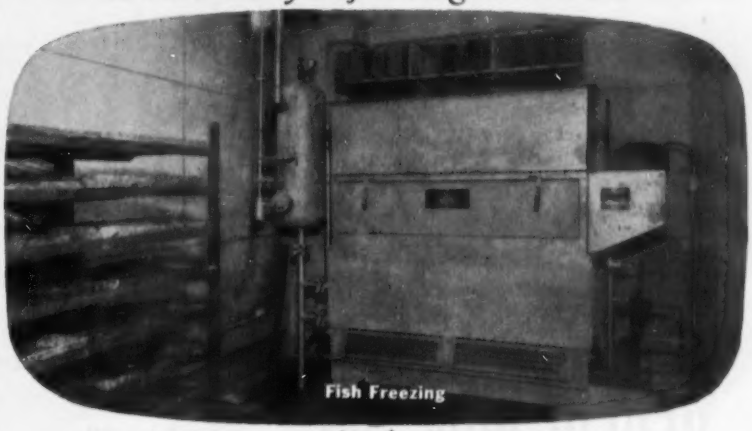
Flours treated with Cl_2O_2 at the normal level used for oxidation, and at 10 times this level have no adverse effects on rats receiving them as 56.8% of the diet.

General health, survival, body weight gain, fertility and number of offspring, birth weight and weight gain during lactation, histopathological appearances, and relative

NIAGARA "NO FROST"

25 Years' Successful Experience

★ *Never any defrosting shutdown*

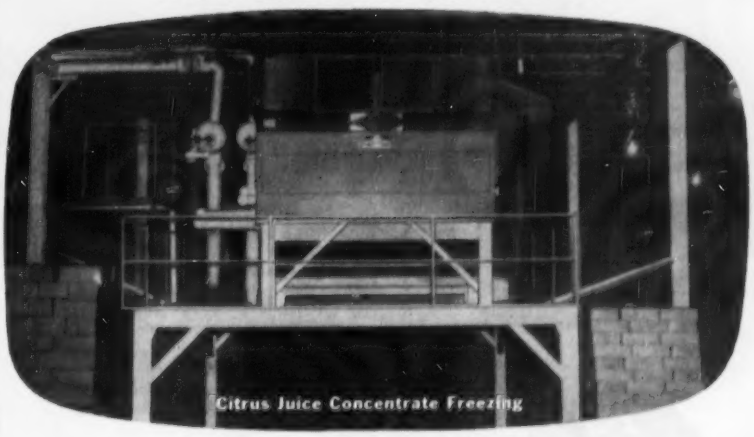


Fish Freezing

★ *Never a rise in temperature*

Vegetable Freezing

★ *Save Power... Reduce Costs*



Citrus Juice Concentrate Freezing

Write for Niagara Bulletin 105

NIAGARA BLOWER COMPANY

Dept. F.I., 405 Lexington Ave. New York 17, N. Y.

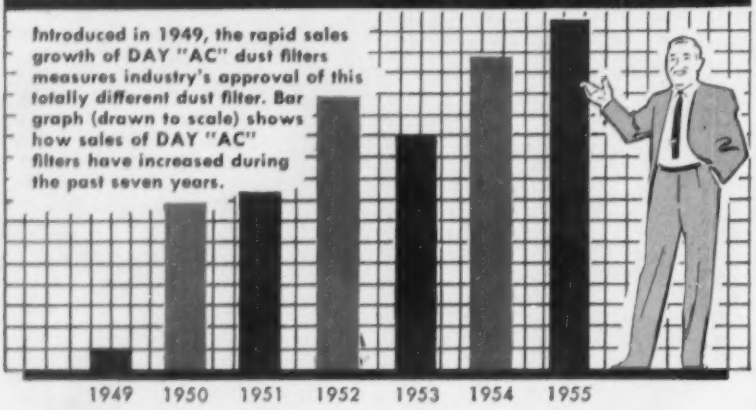
District Engineers in Principal Cities of U. S. and Canada

For more data, circle this page number on card at back →

DAY REVERSE JET DUST FILTERS

HAVE EARNED INDUSTRY'S ACCEPTANCE

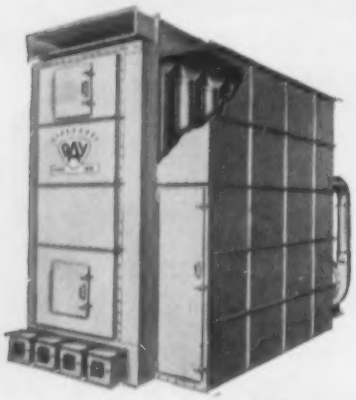
Introduced in 1949, the rapid sales growth of DAY "AC" dust filters measures industry's approval of this totally different dust filter. Bar graph (drawn to scale) shows how sales of DAY "AC" filters have increased during the past seven years.



HERE'S WHY DAY Reverse Jet Dust Filters HAVE EARNED ACCEPTANCE!

Utilizing the Hersey principle of reverse air cleaning, DAY "AC" dust filters offered industry a needed, long overdue, improved dust filter. This filter has many benefits never before found in any dust filter equipment.

- NEW HIGH EFFICIENCY PERFORMANCE—This filter provides efficiencies measured as high as 99.99+%. This assures cleaner air and higher product recovery.
- NEW FILTER MEDIA—DAY *felted* filter media traps more dust than woven fabric. Felt gives higher efficiency, longer life and has same pressure drop as woven fabric.
- NEW DESIGN FEATURES—The Hersey principle of reverse jet cleaning, DAY self-adjusting blow rings, sanitary square-to-round air inlets, automatic-continuous operation, superior filter media, are just a few of the features introduced by DAY.
- NEW FILTER TUBE CLEANING—Patented self-adjusting blow rings clean the entire filter tube automatically and continuously, to give DAY filters an air handling capacity 5 times higher than ordinary filters.
- NEW LOW INSTALLATION COSTS—Unit sub-assembly saves time and money—up to 75% on filter erection costs.



Licensed by H. J. Hersey, Jr.

The DAY "AC" Reverse Jet Dust Filter is the largest selling filter of its type in the world!

Place the successful operation of your dust control system in our hands. Experienced DAY Application Engineers will survey your plant and supply you with engineered recommendations. With DAY there is no divided responsibility. Our guarantee of satisfaction is backed by 75 years of experience.

Bulletin 559 gives important facts and complete description of the DAY "AC" dust filter. Write toDAY for your copy of this informative 24-page bulletin.

75 YEARS SERVING INDUSTRY SINCE 1881

The **DAY** *Company*

817 Third Avenue N. E., Minneapolis 13, Minnesota
IN CANADA: P. O. Box 700, Fort William, Ontario
Branch Plants: Buffalo, Fort Worth and Toronto, Ontario
Representatives in Principal Cities

weights of the main organs were the criteria applied to three generations of rats consuming the diet.

Even at the higher level of treatment, where flour is almost unusable for breadmaking, and the crumb goes rancid very readily, there is no evidence of significant deleterious effect on the nutritional value or the flour proteins, nor for the formation of abnormal or toxic products.—*Journal of Science of Food & Agriculture*, 464-70, July, 1956.

Effect of Antibiotics On Spoilage Bacteria

In a study of the effect of subtilin, nisin, and other substances on the thermal resistance of food spoilage bacteria, more than 100 parallel determinations of *D* values were made for subtilin and over 30 for nisin.

Except for *C. thermosaccharolyticum* 3814 these two antibiotics always reduced the *D* value, the greatest reduction being for *B. coagulans* with nisin. Of approximately 90 other antibacterial substances tested, none was found as effective as the above two in reducing the thermal resistance of spores of P. A. 3679, although aureloic acid had some effect.

Special effort was made to find factors that might influence the extent of *D* value reductions by subtilin and nisin, but none was found that markedly affected the proportionate reduction.

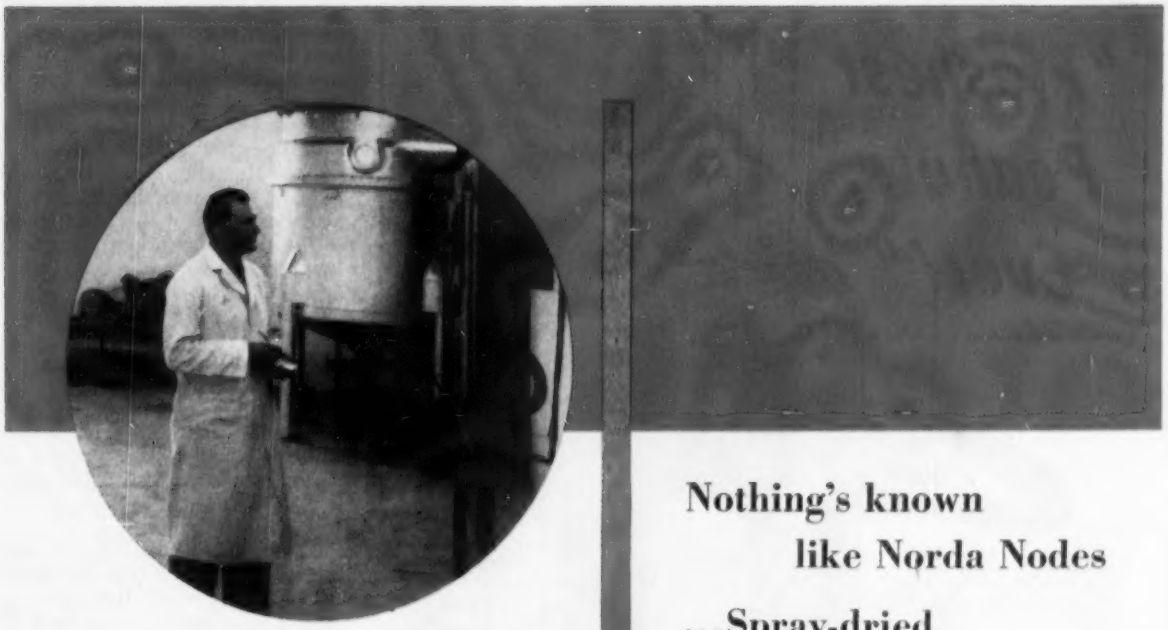
Among factors tested were pH of suspending medium, use of various purees for suspending medium, temperature of heating, subculturing medium, and spore concentration. Deviations from negative exponential survival were apparent in some of the experiments. — *Food Technology*, 352-54, Aug. 1956.

Gas Protects Citrus Fruit

Decay of fresh citrus fruits can be inhibited for a period of 8-14 days by subjecting to an atmosphere of pentachlorethane or tetrachlorethane, or a mixture of either or both of these two with trichlorethane.

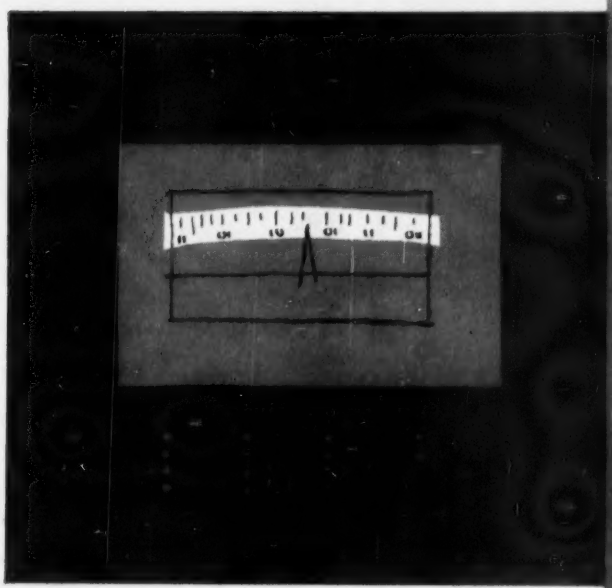
The patented process is applicable also to other fresh fruits and vegetables. The gas is also an effective degreening agent for citrus fruits and tomatoes.

In application, crated fruit is stacked in a railroad car or truck, refrigerated or otherwise, and a predetermined quantity of the composition is placed in the car in a



Electrically exact quality control governs the uniformity of Norda Nodes, in the nationally notable new Norda spray-drying plant.

Nothing's known like Norda Nodes ...Spray-dried for you by Norda



The name for fine spray-dried flavors now seems to be Norda Nodes.

By superior methods, with today's most efficient machines, Norda locks true-fruit flavors into almost invisibly tiny, colloid-coated particles. Their *in-blown, in-grown* richness is released only when liquids meet the dry mixes they flavor.

You consequently get complete flavor uniformity. Your flavored products have longer shelf and storage life. The *real* flavors you put in your products reach your products' satisfied users unchanged.

Find out about the excellence and economy of Norda Nodes. Your business letterhead brings *free samples*.

"Flavor it with a Favorite"— Norda Nodes

Norda.

Norda, Inc.
601 West 26th Street, New York 1, N. Y.

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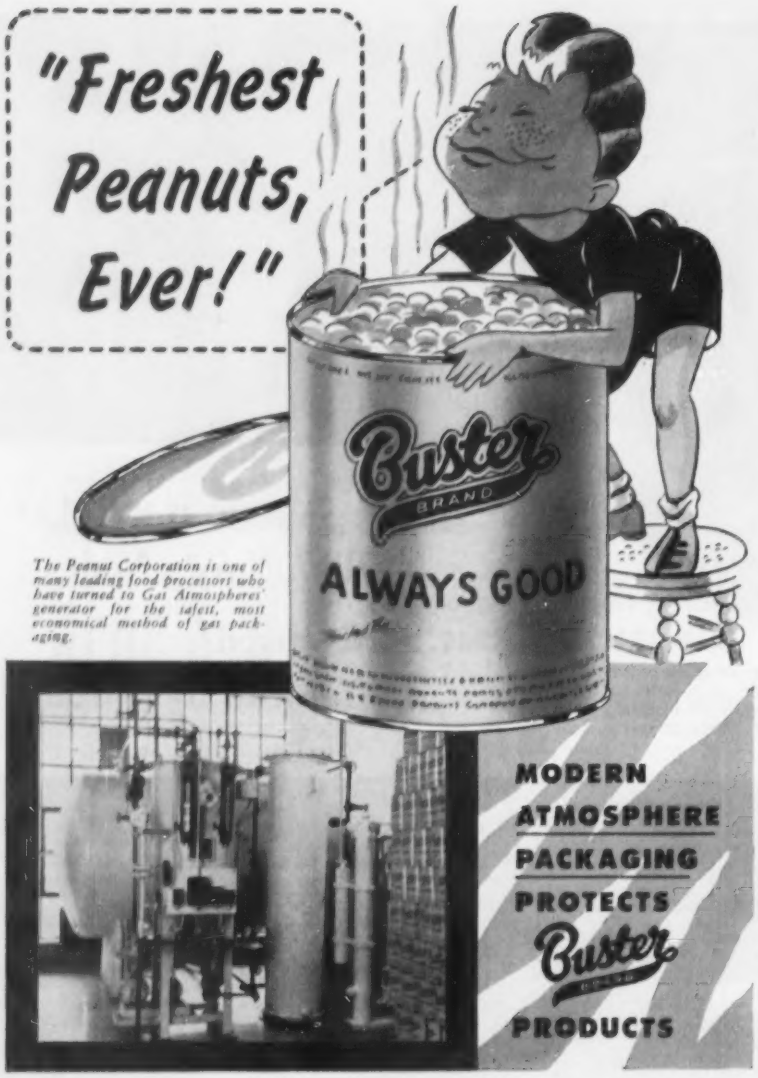
"Freshest Peanuts, Ever!"
Buster BRAND
ALWAYS GOOD
The Peanut Corporation is one of many leading food processors who have turned to Gas Atmospheres' generator for the safest, most economical method of gas packaging.
MODERN ATMOSPHERE PACKAGING PROTECTS Buster PRODUCTS

PEANUT LOVERS who have tested Buster Brand salted nuts will tell you they are roaster fresh whenever and wherever you buy them. This fact has helped make Buster Brand the nation's fastest selling peanut.

There is no secret to Buster's freshness, unless it could be the speed with which they are moved from the field to the roaster to the can. As for keeping them fresh in the can, the makers of Buster Brand peanuts, first use standard vacuum equipment to draw all oxygen out of the package. They then apply modern gas packaging techniques to make doubly certain that taste-robbing oxygen absolutely cannot get to their products.

To be sure of highest purity gas at lowest cost they selected, after thorough investigation, a Gas Atmospheres' generator. The equipment was "entirely satisfactory" from the start. In fact, Peanut Corporation of America, makers of Buster Brand products, now specify Gas Atmospheres' equipment for use in all their modern packaging operations.

9952

gas Atmospheres, inc

equipment for producing industrial gases

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container or poured on the floor and allowed to evaporate. Car is usually kept closed for about 24 hr. to insure thorough blanketing of fruit by the gas.

From 7-30 c.c. of the composition is used per 100 cu. ft. of unoccupied space. Humidity may be disregarded. Numerous laboratory tests have demonstrated the effectiveness of the treatment in protecting fruit from bacterial attack.—U.S. Patent 2,748,004, May 29, 1956.

Concentrated Fruit Puree

Difficulties encountered in making concentrated fruit purees by conventional methods are obviated in a patented process, first step of which is dehydration of the fruit to 50% its original weight.

Drying is accomplished in a cabinet, tunnel, or belt-type dehydrator in which the whole fruit, skin intact, is subjected to a current of air or gas heated to 160-200 F.

While still hot, fruit is pulped to form a puree and to separate pits and skins. This can be carried out in a conventional paddle finisher which comprises a rotary cylindrical screen and rotating paddles within.

Concentrated puree is immediately canned, and the cans heated to sterilization temperature. Entire operation should be expedited so that the puree will have a temperature of 150-165 F. when cans are sealed.—U.S. Patent 2,752,253, June 26, 1956.

Time-Temperature Studies In Chocolate Tempering

Success of chocolate tempering depends partly on cooling rate, partly on total fat content, and partly on composition of fats in the product.

Behavior during and subsequent to tempering has been explained by the extent to which one or more of the four known forms of cocoa fat crystals are formed, as well as by the size of the crystals. Before tempering chocolate should be heated to 114-120F. Following this the temperature depends on rate of cooling.

A vanilla coating chocolate (without milk) may become tempered at 93F. after 3 hr. of cooling and stirring. But if these steps are completed in 40-60 min., it will be tempered at 89.6F. A 15-min. cooling will temper chocolate at about 86 deg. F., and a 30-sec. cooling at about 82.6F. Chocolates tempered

to low temperatures may have to be reheated if they are to be stored for any length of time.

Milk fat in a full cream milk chocolate reduces tempering temperature by about 1.8 deg. F. Cocoa powder can be tempered in much the same way as chocolate and is also subject to bloom. If correctly tempered and then chilled too rapidly delayed bloom may occur and the natural gloss will be replaced by a dull white color.

For a 25% fat cocoa correct tempering temperature is 93.2-95F.; for a 22% fat product 96.8-98.6F., and for a 17% fat one about 107.6F.

Cooling temperatures for properly tempered cocoas, molded chocolates, and coated goods are also important if bloom is to be prevented. For hand dipped chocolates cooling in air of about 59F. is satisfactory, but machine coated pieces require 71.6F. or more. Molded chocolate and cocoa will take lower temperatures but less than 10 deg. for chocolates, and 16 deg. for cocoas may result in delayed bloom.—*International Chocolate Review*, 11(8), 344-48, Aug. 1956.

Thiamine Losses in Baking

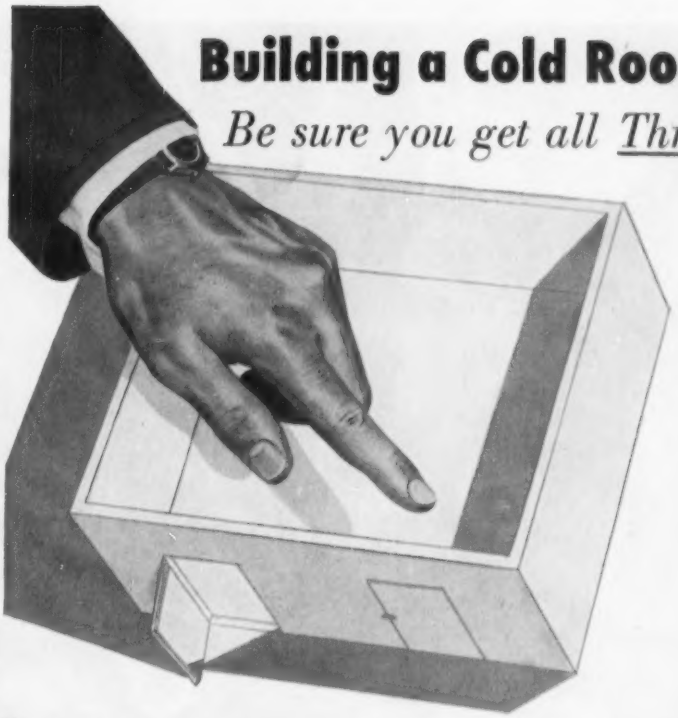
Baking and toasting of cereal foods entails losses of a part of the vitamins in the flour and other formula components.

Because of conflicting reports on the extent of such losses, particularly thiamine, breads, cakes, and cookies were made from yeast and various flours carefully assayed for thiamine before baking.

Mean baking losses in breads for the 5 types of flour used were: Patent flour containing 2.12 mcg. thiamine per g., 21%; unbleached, untreated 80% extraction flour containing 1.71 mcg. thiamine per g., 17.3%; an 80% flour containing 1.37 meg. thiamine per g. and 8.4 ppm. $KBrO_3$, 20.7%; an 80% flour treated with 2.15 oz. of Cl_2O_3 per sack, 19.1%; a 100% whole wheat flour, 23.3%. All flours except the whole wheat contained 14 oz. of chalk ($CaCO_3$) per sack.

Loss of thiamine on toasting depends on the thickness of the slice. It varied from 13.4% (12 mm. slices) to 31% (5 mm. slices). Taken in conjunction with baking losses, total loss from flour to toasted bread ranged from 30.7 to 44.8%.

In Madeira cake tests the mean baking loss was 22.7% without baking powder, 33.1% with baking powder. Cookies baked with pyrophosphate-bicarbonate baking powder lost 26% of their thiamine; with



Building a Cold Room?

Be sure you get all Three

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No fillers—no binders—low "K" factor—easy to install—strong—lightweight—flexible. Bonds readily—works as easily as lumber.

2. THE CORRECT DESIGN—UNITED'S DESIGN SERVICE

Our engineers are trained insulation experts—available to consult, design and specify complete installations of insulation for practically every job condition and to your specifications.

3. THE PROPER INSTALLATION—UNITED'S INSTALLATION SERVICE

Our skilled erection crews, located at each of our branch offices can handle your complete installation. Avoid delays and improper applications of insulation by using United's experienced design and installation service.

United Cork Companies' have 50 years of experience and leadership in serving the requirements of the refrigeration industry with a quality product. If you have a low temperature insulation problem, use the coupon below for additional product information and installation data. Your United representative will be glad to advise you.

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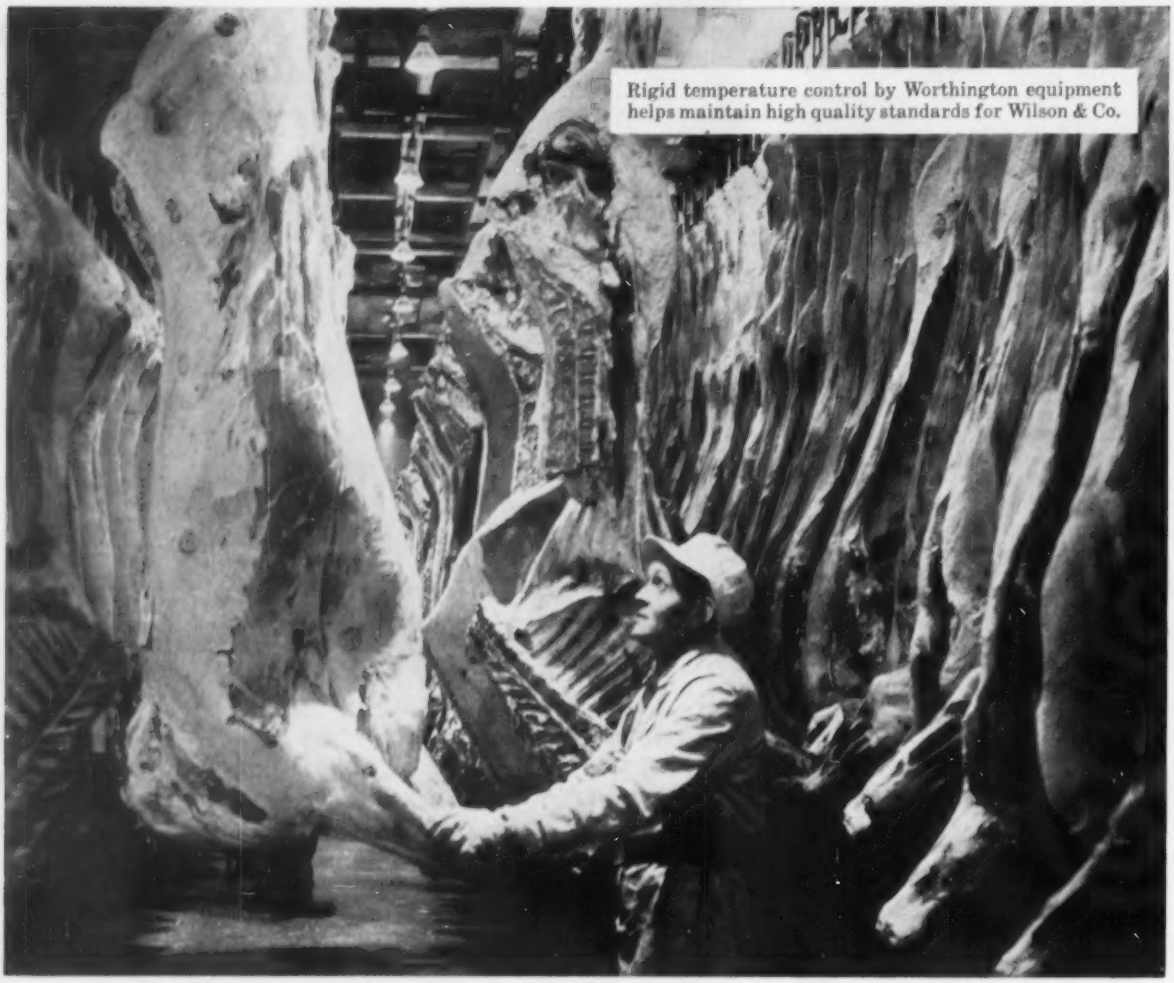


Rigid temperature control by Worthington equipment helps maintain high quality standards for Wilson & Co.

Wilson & Co. achieves constant cool temperatures with Worthington Y Ammonia compressor

At the Wilson & Co. packing house in Kansas City, Worthington refrigeration equipment plays an important part in the expert processing of well over 1,000 cattle and hogs per day.

Wilson stresses heavy duty dependability in their refrigeration requirements. That's where the rugged design of the Worthington Y Compressor pays off. It's designed for continuous trouble-free operation so necessary in meat processing plants.

A Worthington Y Ammonia Compressor, similar to the 155 ton unit shown here, can give you extra dividends too, by saving on costly foundations and valuable floor space. The vertical arrangement saves space, and a flange mounted motor may be used, thus eliminating the need for a separate motor foundation.

An outstanding feature of the Y Compressor is the Worthington Feather* Valve. It is the lightest, simplest, and most efficient valve ever developed for refrigeration compressor work. Valve strips open and close with a gentle rolling motion—there is no destructive impact. Valve action is extremely sharp with a perfect responsiveness to flow.

Three heavy duty double-roller main bearings, supported by the main frame, assure you of permanent alignment and overall rigidity. There are no motor alignment problems.

All materials which conform to Worthington high standards are used in construction of the Y Compressor. You can be sure the Worthington Y Compressor will serve you dependably and efficiently.

For details, write: Worthington Corporation, Air Conditioning and Refrigeration Division, Section A.6.120-FE, Harrison, New Jersey.

Your refrigeration problems can best be solved with a Worthington Y Ammonia Compressor. Available in single or two stage. Capacities: 60 to 460 tons.

*Reg. U. S. Pat. Off.

WORTHINGTON

CLIMATE ENGINEERS TO INDUSTRY, BUSINESS AND THE HOME

ammonium carbonate as leavening agent, 29.7%.

Thiamine destruction in baked goods is mainly thermal and depends on the final temperature, time of heating, and size of pieces baked.—*Journal of Science of Food & Agriculture*, 457-64, July, 1956.

Continuous Weighing

An improvement in continuous weighing is claimed for a patented device that indicates total weight of belt-conveyed material regardless of running speed of conveyor.

Material is carried on a continuously-driven endless belt, part of which passes over a weigh bridge that rests on a magnetostriction cell. Pressure on the cell causes it to function, and variations are transmitted to a magnetic amplifier.

Belt motor also drives a tachometric generator, current of which is used to drive a motor actuated by difference in voltage delivered by tachometric generator and by the line circuit voltage in function of the speed of transport. This motor moves the index of a potentiometer, from the taps of which come the current that amplifies that of the magnetostriction cell.

Voltage obtained between movable point of potentiometer and its end tapping is used to drive the motor of a calibrated weight totalizer.—U.S. Patent 2,746,739, May 22, 1956.

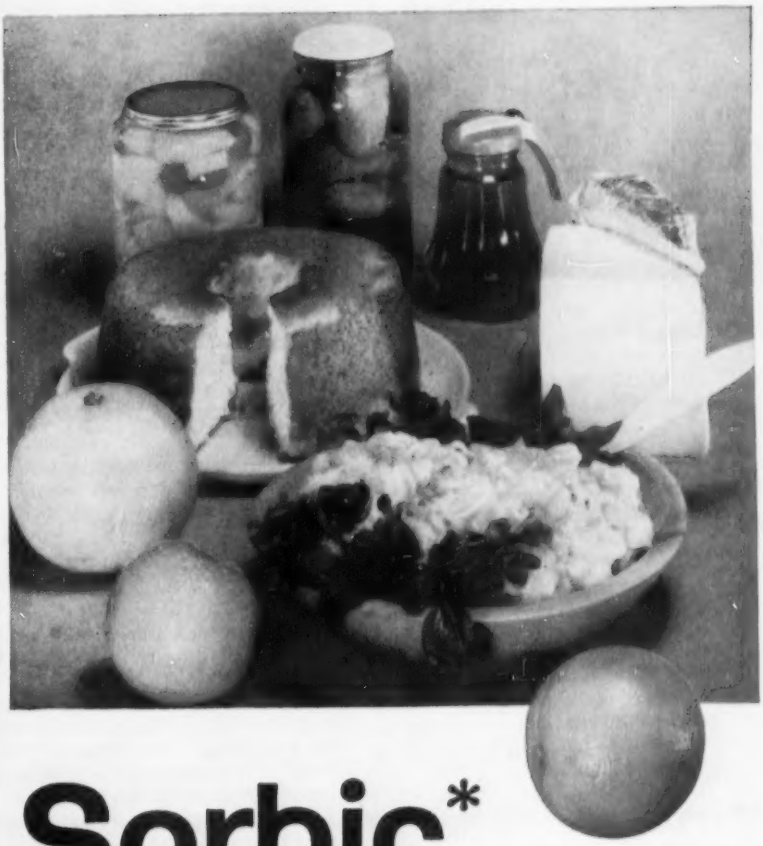
Stabilizing Beer

Oxidative stability of beer and elimination of gushing can be accomplished by addition of a small amount of ethylenediamine tetra acetic acid or one of its salts.

From 5 to 250 ppm. of the acid or salts is sufficient to bring about desired results. The compound can be added at any convenient point in the manufacturing process—to malt before or after it is kilned, to brewing water, to mash, to kettle with the hops, or to the beer after filtration and just before bottling.

Adding it to the finished beer is more economical, but it is more convenient to add it to the malt. Tests with numerous varieties of beer showed control or elimination of the tendency to gush, with attendant loss when the bottle was opened.

Treated beers were substantially clear for the period of the tests, whereas control samples ranged from hazy to very hazy.—U.S. Patent 2,748,002, May 29, 1956.



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- Controls growth of many molds and yeasts.
- Safe at required levels—it is metabolized like fatty acids in foods.
- Contributes no flavor or odor—when properly used.

For further information on how you can protect your food product with Sorbic, write the CARBIDE office nearest you for Technical Bulletin F-6568. Offices in principal cities. In Canada: Carbide Chemicals Company, Division of Union Carbide Canada Limited, Montreal.

*CARBIDE'S *refined sorbic acid for use in foods.*

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A Division of
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30 East 42nd Street UCC **New York 17, N. Y.**

QUESTIONS & ANSWERS

THIS MONTH'S PROBLEM

Baking to Uniform Color

Question—I'm running a continuous sheet of dough through a band-type oven and finding it extremely difficult to bake it to a uniform color. Have you any suggestions on how I can automatically control color of the baked sheet of dough?

AUGUST PROBLEM

Controlling Liquid Level

Question—Have you any suggestions for an effective liquid-level control on a small continuous blender whose mixing action results in quite a vortex? Capacity of the blender is small in relation to the throughput, and the product is thick and practically non-conducting. Attempts to use a ball float were not successful.

Answer—You have two separate but inter-related problems. One is to detect the level in the mixer at all times, and the second is to control the outgoing flow rate.

We assume that vortex and consistency, or a combination of both, interfere with reliable functioning of a ball float. Also, your non-conducting material would preclude use of the usual electronic probe-type control that depends upon the product to complete the circuit.

Under these unfavorable conditions, we suggest you consider a relatively new type of control (Robertshaw Fulton Controls Co., Fielden Instrument Div., Phila.). This unit employs a probe that depends upon its electrical capacitance being altered by proximity of material being controlled. It can be made of stainless steel construction and provided with a Teflon sleeve to curb adhesion of thick product.

Minute electrical signals are sensed as product approaches or touches the probe, and can be electronically amplified to activate the control.

Because of small holding capacity of mixer in relation to throughput, a throttling-type, or modulating, control would probably give better results than an on-off one. If flow rate in either input or output lines can be fairly well stabilized (as with a constant-displacement pump), control can then be maintained with a throttling valve on the other line.

Various automatic valves are available for electric or air operation. We suggest you consult manufacturers (Automatic Switch Co. or Food Equipment Specialties Co.) for recommendations on the proper size and method of installing them.

Another Answer

A liquid-level control (in a small continuous blender) is currently being used successfully in a continuous cake-batter mixing process. Materials handled in the pre-blender form a thick slurry (as noted in the August problem).

Level-control mechanism is actuated by a control device, which combines the principle of a float valve and an airfoil to maintain buoyancy over the slurry. During downtime, the float, which has an inverted "teardrop" cross-section, is partially buoyed by slurry in the bowl.

When blender is running, the float rides along the perimeter of the vortex. Because of the angle of attack formed by the surface of the float and the slurry, it remains on the surface at the highest level, despite any variations in specific gravity.

Control of liquid level may then be achieved either by governing the rate of entering ingredients or the rate of removal of the mixture.—*Edward S. Olney, Bryn Mawr, Pa.*

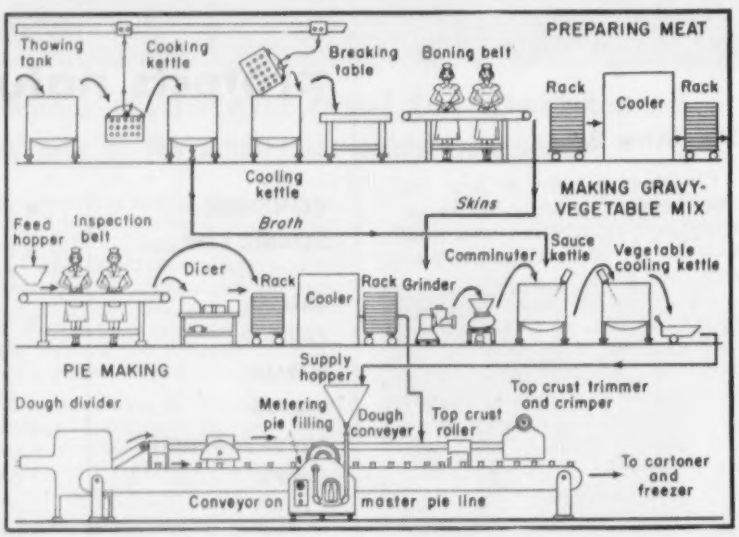
HOW TO DO IT?

Readers are invited to submit to FOOD ENGINEERING answers to question, "This Month's Problem." Selected answers will be published with credit (unless you specify otherwise). We pay space rates.

JUST ASK US

Subscribers also are invited to send in food engineering questions. We undertake to provide answers, free, to the best of our ability. We do not undertake costly investigations. Give full information and your name. Your identity will not be disclosed.

Write to Questions & Answers Editor, FOOD ENGINEERING, 330 W. 42nd St., New York 36, N. Y.



Frozen Pot-Pies Produced in 5-Step Operation

Question—We are looking into the possibility of getting into the manufacture of frozen chicken and turkey pies. As a preliminary, could you give us a general step-by-step description of how they are made? It would be our intention to prepare the meats from frozen, whole eviscerated poultry.

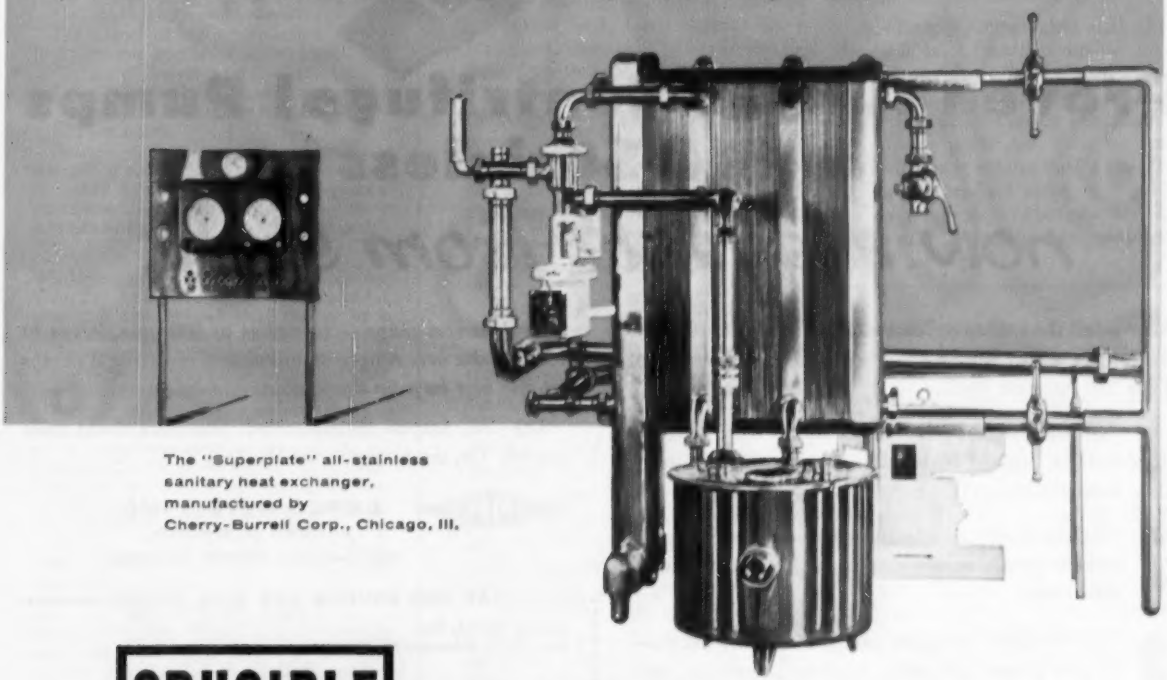
Answer—In general, five major steps are involved: Preparing the meat, cooking the gravy and vegetable combination, making the pies, packaging, and freezing (drawing).

why STAINLESS for this fluid-food heat exchanger?

Plate-type heat exchangers like this one, made practical by *stainless steel* construction, have become workhorses of the food processing industry. Liquids traveling through the unit at high velocity make *stainless* almost mandatory.

In fact, due to its inertness, corrosion resistance, easy cleaning and ability to stand high temperatures, *stainless* is being used more and more for all types of heat exchangers, evaporators, spray dryers, vacuum pans, and milk handling equipment.

It not only makes for more efficient processing, it actually cuts operating costs. For *stainless* equipment far outlasts other types, and it requires a minimum of costly maintenance. Next time you're buying equipment, be sure it's *stainless. Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*



The "Superplate" all-stainless sanitary heat exchanger, manufactured by Cherry-Burrell Corp., Chicago, Ill.

CRUCIBLE first name in special purpose steels

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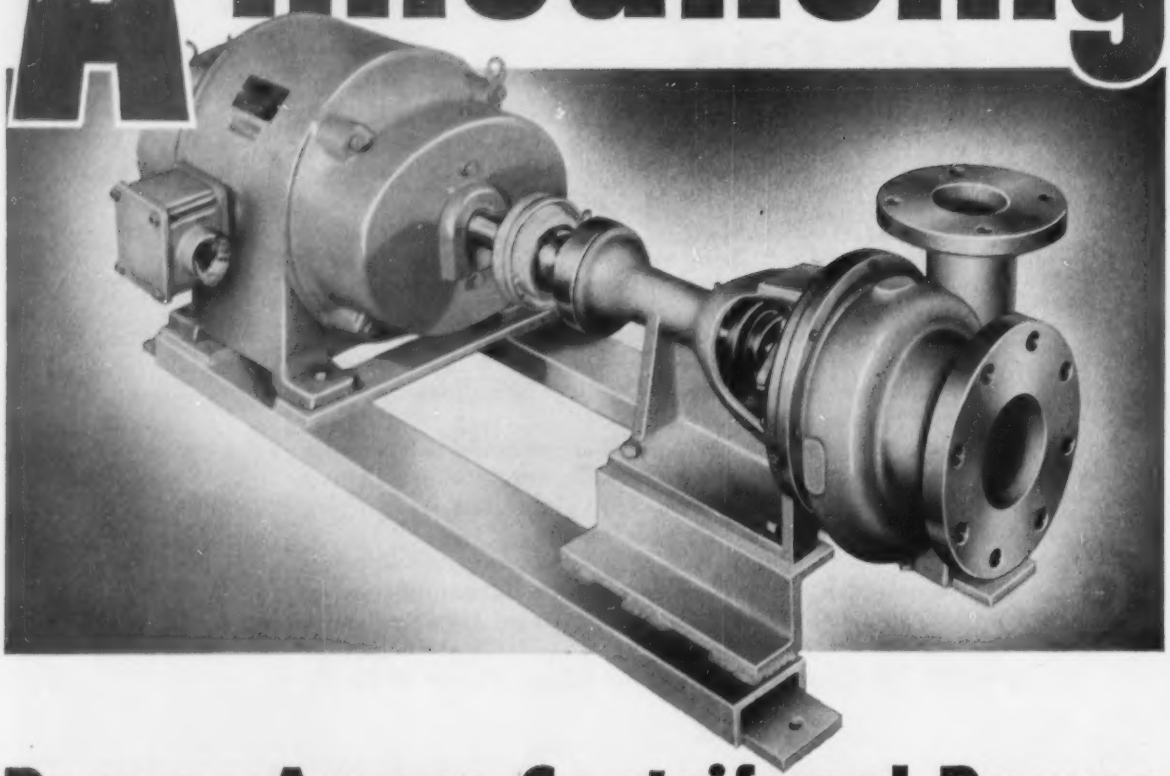
Announcing



Proven Ampco Centrifugal Pumps in 316 Stainless

now available from stock

Now — all the exclusive "custom-built" features of proven Ampco alloy pumps are also available in standard Type 316 stainless steel.

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2. "Off-the-shelf" stainless pumps with wear rings — to save the casing, prevent expensive repairs, reduce down-time.
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Whether you specify these proven pumps in Ampco alloys or 316 stainless steel, you get versatility of selection, dependability, and economy unmatched in pumps today.

In their size range — capacities to 600 gpm, heads to 160 ft.—the *new* Ampco stainless-steel centrifugal pumps are the *best buys* on the market.

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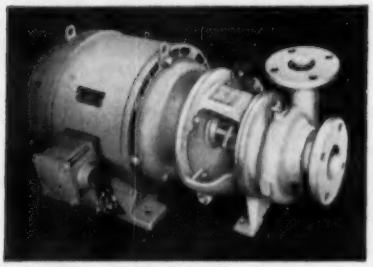
(Advertisement)

New Ampco Stainless-Steel Centrifugal Pump



New Line of Stainless-Steel Centrifugal Pumps

The Ampco "Z" line of stainless centrifugal pumps has been announced by Ampco Metal, Inc., Milwaukee 46, Wisconsin.

Although these pumps will be carried as stock items, they incorporate features which, until now, have been available only on special order for custom-built models.

A Series of Pumps

The new "Z" line is a series of high-speed, closed-impeller pumps for handling clear liquids and fine slurries that are not corrosive to GR.316S.S.

Pedestal assemblies are available for base-mounted coupling connections. Close-coupled connections fit NEMA standard pump motors.

Hydraulic range includes capacities to 600 gpm, heads to 160 ft.

Range of Combinations

Standard "Z"-series Ampco pumps are easily adapted to the particular requirements of specific applications. Deviations can include:

(a) Choice of materials for impeller, sleeve, rings, and pedestal.

(b) Choice of bearings — sealed, replenishable grease- or oil-lubricated, single or double rows.

(c) Choice of mechanical seals, and of internal or external lubricated stuffing boxes.

Because stock components can be interchanged, a pump can be altered in the field to satisfy new requirements when process conditions change. Obviously, this is more economical than replacing the complete pump.

High Efficiency

Working parts of Ampco "Z" pumps are shaped to conform to the natural pattern for imparting velocity and head energy to a fluid. This tends to check the damage caused by corrosives and abrasive slurries under the aggravating environment of highly turbulent flows with their high relative velocities.

Because destructive relative velocities are greatest where rotating and stationary parts are in close proximity, wear rings are inserted in the casings of Ampco "Z" pumps. Corrosion and erosion damage can be corrected by replacing the low-cost rings, instead of the more expensive casing and cover.

Likewise, the use of shaft sleeves eliminates the need for shaft replacement, saves time and maintenance costs.

"Off-the-Shelf" Units

Ampco "Z"-series pumps will be stocked ready for shipment in as little as one day, depending upon adaptations required.

Complete parts inventories will be maintained for one-day shipment of repair and replacement parts.

Bulletin P-3C is available. For a free copy, fill out and mail the coupon on the opposite page . . . *Ampco Metal, Inc., Milwaukee 46, Wisconsin.* P-26A

First, preparation of the meat:

Thaw frozen birds in a defrosting tank. Defrosting can be sped by recirculating water through a perforated pipe at the bottom of the tank.

Load thawed birds into perforated, stainless-steel baskets and transfer into cooking vats (with steam coils) or pressure kettle. Cook about 4 hr. in steam vats or 15 min. in pressure kettle (15 lb.).

Next, hoist-raise these baskets of poultry from cookers and transfer them into a cooling vat with circulating cold water. Pump broth from cooking kettles through wire-screen strainer and into a gravy makeup kettle.

Use an electric hoist to dump baskets of chilled fowl onto a stainless table, so that girls can break them into pieces and segregate them into pans for deboning.

Now feed pans of broken-up poultry pieces onto a boning conveyor, which is flanked by girls who debone the pieces—separate meat from bone and skin.

Discard bones and retain skin (for imparting flavor to gravy stock). Collect meat in trays and load on racks which are rolled into a chill room (about 36F.) where they are held for 3-4 hr.

Inspect meats by dumping them into a stainless hopper feeding an inspection belt. Girls inspect them for remaining skin, blood vessels, bone fragments, etc.

Collect meats in pans and load them onto portable racks. (Large pieces can be fed to a dicer, and diced meats can then be mixed with small pieces in trays loaded on portable rack.) Roll racks into a cooler to hold until needed.

Now to making the gravy-vegetable mix:

Flavor of the gravy is enhanced by incorporating skins. They are first run through a meat grinder and then a comminuter, which reduces them to a paste.

Vegetables (peas, carrots, and potatoes) and gravy are separately prepared, and then blended. Vegetables (diced) are charged into perforated baskets and precooked in jacketed kettles.

Mixed vegetables are now ready for blending with gravy.

Meanwhile, make up the gravy—a blend of skin-paste broth, spices, seasoning, stabilizer, etc.—in an agitator-type, jacketed kettle. When vegetables have been combined with gravy, the mixture is ready for cooling and for subsequent filling into the pies.

Pump gravy mix into an agitator-type cooling tank, of the water-jacketed, direct ammonia-expansion type. Mix is now ready for feeding into pies.

Next step is machine making of pies:

Heavy-gage aluminum foil pie plates are first deposited from a loading magazine onto chain-driven, metal plate holders for feeding to the pie-making machine.

At this point, an automatic divider cuts out dough balls which are conveyed to a pair of corrugated, adjustable metal sheeting rolls. Sheet then travels along a belt to stainless steel, vertical-type cutters that divide it into four balls (for top and bottom crust) at a time.

A double row of dough balls continues out of machine on a take-off conveyor, from which they travel on separate belts to two high-speed crust rollers.

Bottom crust is formed first. Belt-conveyed dough balls drop into a hopper holding dusting flour. An operator picks up dough balls and places them, one at a time, on a short feed belt carrying them to the first pair of crust rolls. Operator then feeds dough sheet to the second pair of rolls (cross-sheeter) to develop a flaky crust.

Q.—Do you know of a simple way of checking the timing and adjustment of machine parts on automatic units installed on our packaging line? We'd like to make this a regular maintenance function.

A.—Install a graduated dial (360 degrees) on a shaft revolving once for a complete cycle of the machine. Hand-turn this shaft so as to carry along the dial. Timing relationship of moving parts can then be read from dial as it rotates past a pointer. Prepare a standard chart as a guide for your operators who can periodically make readings to maintain proper settings.

A second operator removes dough sheet from discharge chute of crust roller and deposits it over four chain-driven pie-plate holders. Next, a 4-headed, sponge-rubber-coated "docker" tamps dough sheet to mold it around bottom and sides of aluminum foil pie plates.

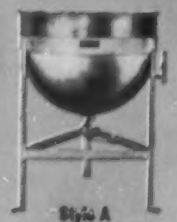
Filling of pies with gravy-vegetable mix follows:

A portable, volumetric-type filler with two rotary filling heads is synchronized with the pie line. Unit contains a conical stainless-steel

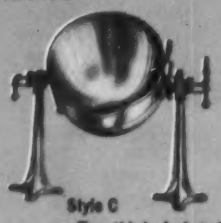
For more data, circle this page number on card at back →

LEE
Corrosion-Resistant
PROCESSING EQUIPMENT

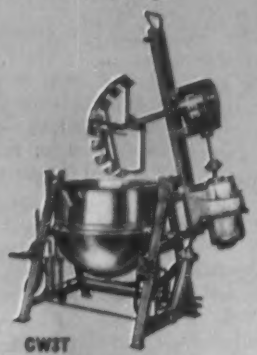
PRECISION BUILT OF STAINLESS STEEL
TO YOUR SPECIFIC REQUIREMENTS

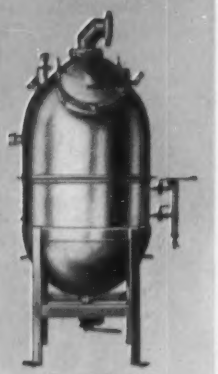

Style A
Two-thirds Jacketed
5 to 500 gal.

Style B
Full Jacketed
10 to 300 gal.

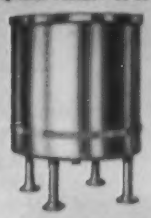

Style C
Two-thirds Jacketed
5 to 100 gal.

Pressure Kettle
Two-thirds Jacketed
40 to 200 gal.


CWST
Center-line Scraper
Agitator Kettle—80 to 300 gal.


Vacuum Pan
50 to 500 gal.

Style CW
Two-thirds Jacketed
80 to 300 gal.


Pulp Tank
500 to 2,000 gal.

Storage Tank
100 to 5,000 gal.

Quick Cooling Pan
50 to 200 gal.

LEE
Technical bulletins fully describing these processing units gladly sent on request.

METAL PRODUCTS CO., INC.
416 PINE STREET, PHILIPSBURG, PA.
Designers and Manufacturers of
Corrosion-Resistant Processing Equipment
for over 25 years.

supply hopper (30-gal. capacity), and is equipped with high and low level controls.

Pump delivering gravy to hopper is automatically cut off when product reaches high-level probe and starts after it drops to low-level one. Probes are hooked up to electronic tubes that actuate a magnetic switch to start or stop the cooler-pump motor.

From supply hopper, a positive-displacement pump feeds gravy mix through a stainless pipe into two rotary-head fillers. Gravy is delivered by two revolving, cone-shaped disks each having a pair of outlets that pass over stationary cavities (2x5 in.) within the heads.

Both heads have two outlets, each synchronized with a traveling pie to feed 5 oz. of gravy mix. Quantity of gravy filled into pies can be changed by adjusting pump motor's variable-speed drive.

Further along the pie line, girls scale diced poultry meat into the pies. Top crust, prepared in same manner as the bottom, is placed over four pies.

Trimming, crimping, and sealing of the crusts is then accomplished with a revolving, gas-fired drum containing four serrated heads. Trimmings drop along the sides of plate holders and onto a plate supporting the pies. At pulley end of chain-drive, trimmings drop onto a conveyor that returns them to the end of the pie machine. Trimmings are re-used in bottom pie dough.

Meanwhile, pies are mechanically raised from plate holders by vertical, tapered lift pins. Pies are then picked up by three horizontal take-off bars. They are carried along these bars by steel fingers attached to a driving chain.

Pies continue on to a cartoning machine, where flat, folding cartons are picked up and set to receive pies.

Cartons are finally loaded onto racks that are transported into freezers. After freezing, they are machine-overwrapped.

Hauling Reefer Cargo

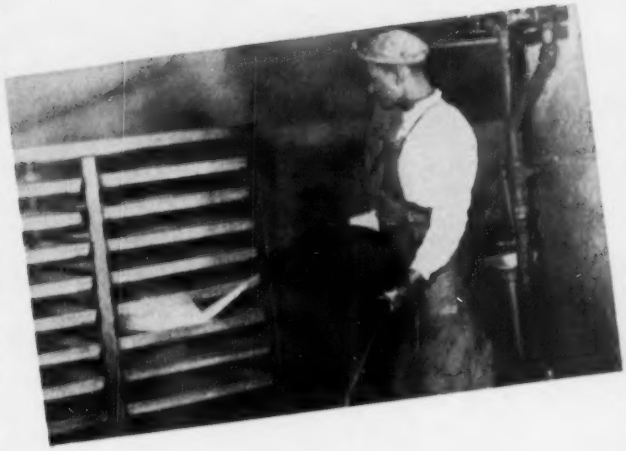
Question—We'd appreciate information on the type of refrigeration most commonly used for trucks and trailers hauling frozen foods. And do you have any figures on refrigeration unit cost per truck per mile?

Answer—Here are results of a survey carried out 2½ yrs. ago (by McGraw-Hill's *Fleet Owner*) among 81 executives whose companies operated 2,180 refrigerated vehicles. It showed

WASHDOWN HOSE

Washdown hose that's never a washout

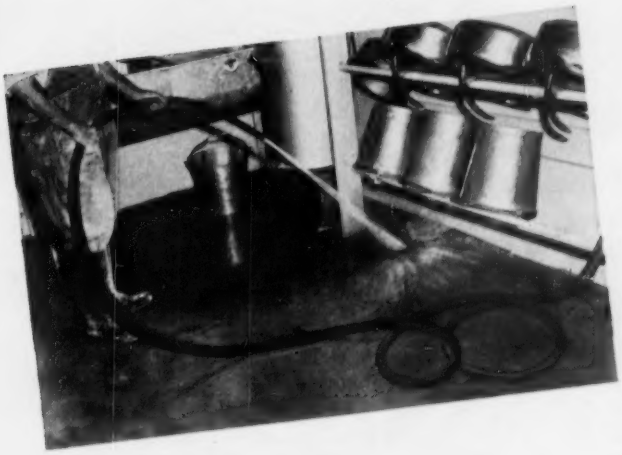
FOR HOT WATER OR LOW-PRESSURE STEAM



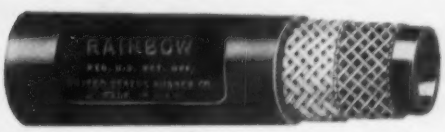
For washing, cleaning and sterilizing equipment, this specially compounded **U. S. RAINBOW® CREAMERY HOSE (STYLE P-255)** has a white, strong and flexible cover, resistant to destructive effects of grease and lactic acid. Nozzle can be built integral to prevent chipping of fragile linings in tanks and sterilizers.

U. S. PACKER'S WASH-UP (STYLE P-7093) is very flexible, but very rugged. Four-ply carcass duck assures easy handling, perfect balance. Cover of black neoprene resists destructive action of animal fats, oils, and abrasion.

FOR COLD OR WARM WATER



U. S. PEERLESS® WATER HOSE (STYLE P-365) has a tube of extruded natural rubber to provide a smooth waterway. Carcass of braided rayon for longer life in high-pressure service. Highest grade brown cover is specially compounded for resilience, resistance to abrasion and other abuse. Particularly good for fruit and vegetable processing plants.



This attractively priced hose, **U. S. RAINBOW WATER HOSE (STYLE P-340)**, has a carcass of exceptional strength and flexibility, thanks to two braids of high-twist cabled rayon. Tough rubber cover resists abrasion from dragging or scuffing. Seamless tube of special rubber stock.

"U. S." Hose is available at any of the 28 "U.S." District Sales Offices, at selected distributors, or write us at Rockefeller Center, New York 20, N. Y.

Mechanical Goods Division

United States Rubber

For more data, circle this page number on card at back →

MERCK INGREDIENTS IMPROVE FOOD PRODUCTS

Here's a golden opportunity for some manufacturer. Peanut butter is a natural for vitamin A fortification. This popular spread lacks vitamin A, but recent tests show that the vitamin can be easily incorporated—with existing equipment.

People rely on fruit and vegetable juices for their vitamin C. Unfortunately, the natural products are highly variable in C content. You can make definite label claims for your juices by standardizing vitamin C content with Merck Ascorbic Acid.

Nutrition-minded Americans rely on modern macaroni products for substantial amounts of food energy. More recently, manufacturers are noting increased consumer acceptance for macaroni enriched with Merck Vitamin Products. Enrichment packs a potent point-of-sale appeal.

With millions of people watching their calories, Merck Calcium Cyclamate—a non-caloric sweetening agent—is a valuable ingredient in a variety of dietetic foods and beverages. It is stable in baking, boiling, and freezing processes, and is compatible with all of the usual flavors.

Research and Production for the Nation's Health

MERCK & CO., INC.
CHEMICAL DIVISION
RAHWAY, NEW JERSEY

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that 53% used dry ice, while 15% did not. And 61% used mechanical refrigeration, while 8% did not. This is an almost even split between those using dry ice and mechanical refrigeration—an indication that both methods are considered satisfactory.

It was found that dissatisfaction with either method was generally due to failure to carry out the manufacturers' operating and maintenance instructions.

Each type of refrigeration has its particular advantages, depending on various operating conditions (length of haul, type of refrigerated cargo, etc.). Since manufacturers of both types of units are continually experimenting and developing, it's important to keep abreast of changes.

This particular survey revealed an average refrigeration-unit cost per truck per mile of 7c. Range from which the average was obtained was 1 to 8c. per mile.

However, bear in mind that the fleet owners in question were operating under their own specific conditions, which might influence the factor of cost.

Oyster Bisque Formula

Question—Among our line of frozen ready-to-heat-and-eat foods is an oyster stew. We'd like to put out a slight modification of it. Do you have any ideas?

Answer—We assume that you mean a product different from oyster stew. If so, then we suggest you consider an oyster bisque.

Try this formula, changing it as you wish:

In a kettle, melt 17¼ oz. of margarine. To it, add 8¾ oz. of flour, and blend. Now slowly add, with mixing until thick and smooth, 49 lb. of heated (160F.) milk. Add liquor drained from oysters, 8¼ oz. of parsley, 2⅛ oz. of celery salt, and 2½ oz. of paprika.

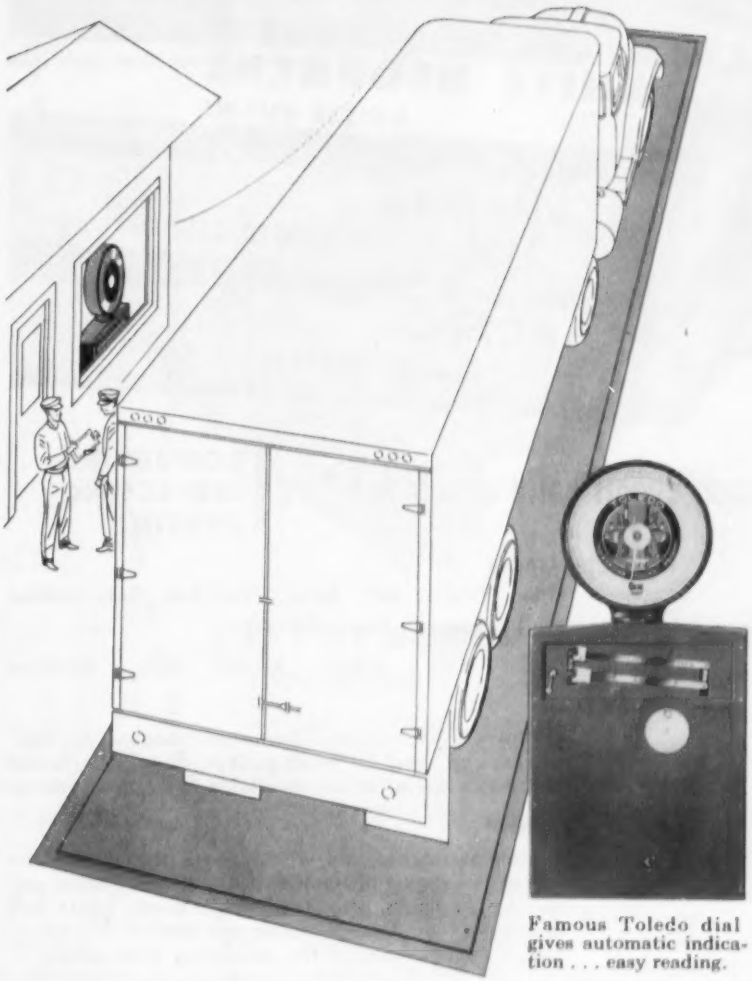
Introduce, a little at a time, 3¼ lb. of beaten eggs. And finally add 24¼ lb. of cooked oysters (finely ground).

Fast Egg Defrosting

Question—Is there any good reliable method of rapidly defrosting frozen egg yolks to be used in making egg noodles? Presently, we allow our yolks to defrost at room temperatures. But we do not feel that this is good practice from a quality standpoint because of the length of time required.

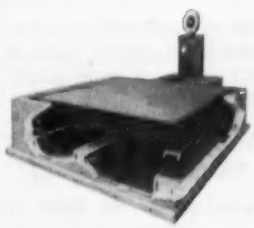
Answer—There is a mechanical "egg-riving" machine (W. J. Fitz-

More and more trucks are weighed on TOLEDOS



Famous Toledo dial gives automatic indication . . . easy reading.

Big choice of sizes to 60 ft. . . . rugged dependability . . . automatic indication



HI-WEIGH AXLE LOAD SCALES
Check load distribution and axle weight. Thrifty shallow pit installation. 20 ton capacity with 8' x 10' platform or 30 ton with 10' x 10' platform.

Avoid loss of profits and good will, caused by "doubtful" weights. Weigh on Toledo Hi-Weigh Truck Scales and know *your load*. Advanced TOLEDO engineering features integrated lever, weigh-bridge and pit for brute-strength with long-life accuracy. Full range of capacities to 60 tons. Choice of two-section, four-section or axle load scales, all available with TOLEDO PRINTWEIGH that records weights on tickets, strips or sheets. Ask the local Toledo office about them, or send for literature. Request form 2417. Toledo Scale Company, Toledo 1, Ohio.

TOLEDO®
Headquarters for Scales

each specifically developed for: CONVEYING INSPECTING SORTING

PROTECTED FROM
Odor Toxics Soil Taste Fiber Rot Deterioration

RESISTS ANY ABSORPTION
Acids Fats Juices Alkalis Oils Moisture

KANRY-TEX
Completely impregnated. Dense and tough — yet flexible enough even for small pulleys. May be sterilized with hot water or steam. Available in white or brown.

WHITE NEOPRENE
Completely constructed with highest grade neoprene rubber, finished with smooth 3/64" cover. Friction surfaced pulley side. Also available in black. White Ruff or brown Kling Top for incline and decline conveying. Brown friction surface for conveying and sorting.

CELLULOSE
Coated with opaque white or clear amber cellulose on both sides or on carrying side only. Smooth, to prevent clinging particles of food, etc. Washable with soap and water.

PLASCELL
Smooth white plastic surface that will not peel or flake. Easy to care for, can be brushed off, wiped with a damp cloth or cleansed with hot water. Also in green or maroon for simplified sorting, inspecting or sizing.

WRITE FOR COMPLETE BOOKLET
"GLOBE PRODUCTS FOR THE CANNING INDUSTRY"
Send for Test Samples — Write Dept. E

GLOBE WOVEN BELTING CO., INC.
1400 CLINTON STREET • BUFFALO 6, NEW YORK
KNOWN FOR QUALITY THE WORLD OVER

patrick Co., Chicago) that has created interest in the baking field and might be applicable in your case. However, it operates so rapidly that the small chips or shavings of egg yolk produced are still solidly frozen.

And there is some doubt that, at temperatures used for egg-dosing of noodles, these chips would be completely dissolved and uniformly mixed into the dough. Of course, incomplete mixing would be visually apparent, and, in some cases, it might even show up in analysis for egg content.

Q.—What's a good spice combination for apple butter?

A.—Blend 105 lb. of Batavia cassia (ground No. 1), 22½ lb. of allspice (ground), and 22½ lb. of cloves (ground). Run it through a No. 14 sieve.

A possible solution would be to use the egg-riving machine to reduce the frozen blocks to fine frozen chips. They could then be run through a hammermill to crush and partially melt them to a pumpable slurry, which might be dispersible during preparation and incorporation of egg solution.

Question is whether rapid defrosting and consequent lower bacteria counts would be enough of an improvement, quality-wise, to warrant expenditure for two additional pieces of equipment and cost of cleaning and maintaining them.

Another solution might be the adoption of a recently patented centrifugal liquifier which is, basically, a heated rotating table. A test of this unit (Bryant Machinery Corp., Jersey City, N. J.) would be the surest way of establishing whether it would produce satisfactory quality at reasonable cost.

Frozen Stews

Question—At present we are successfully marketing frozen soups, but are looking into the possibility of extending this line to include such frozen stews as beef, lamb, and kidney. Do you have formulas that are set up with ingredients listed on a percentage basis? And can you furnish us with working directions?

Answer—Here are three basic formulas that you can alter to suit your requirements:

Beef stew—Beef (1 to 1½-in. cubes), 30.50; water, 31.82; diced potatoes, 25.00; diced carrots, 5.44; shortening, 1.88; flour, 1.88; water (cold), 1.88; diced onions, 0.88; salt, 0.52; pepper, 0.08; and Worcestershire sauce, 0.12.

If you wish, replace one-fourth of

New team to beat your package imprinting costs

PB Tickometer
for labels...

imprints and counts labels as required for current use with necessary date, code, or control numbers... lets you dispense with large stocks of pre-printed labels... expedites packing, prevents waste, cuts printing costs.

- The Tickometer counts and imprints up to 1,000 pieces *a minute*, feeds and stacks automatically. So accurate, that banks use it to count currency! Can also mark or date, code or cancel.
- Handles most any paper weight, or light card stock. Various models take assorted sizes, as small as 1 by 2 inches, as large as 15 by 15.
- Also handles cards, coupons, checks, currency, tags, transfers, sales and production slips. Makes partial or total counts... showing important savings in workers' time.

PB Package Imprinter
for cartons...

can imprint cartons, bags, wraps, etc. as needed ... permits drastic reduction in stocks of pre-printed material, saves on storage as well as printing costs. Also imprints dealer advertising literature.

- Imprints up to 7,500 pieces an hour in an area as large as 4 by 18 inches, on coated or uncoated paper, board, foil or plastic – in sizes up to 18 by 18 inches, from .010 to ⅜ inches thick.
- Liquid ink dries instantly. Printing drum uses rubber mats or type from 6 pt. up.
- Wholly adjustable without tools. Does not require skilled operation. Automatic power stacker optional. Service from 289 locations.

Ask any PB office to show you how the Tickometer and Package Imprinter can make major savings in your business. Or send for booklets and case studies.

Pitney-Bowes, Inc.

Originators of the postage meter... offices in 95 cities in U.S. and Canada

PITNEY-BOWES, INC.
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Send booklet on: ☐ *Tickometer* ☐ *Package Imprinter*

Name _____

Address _____

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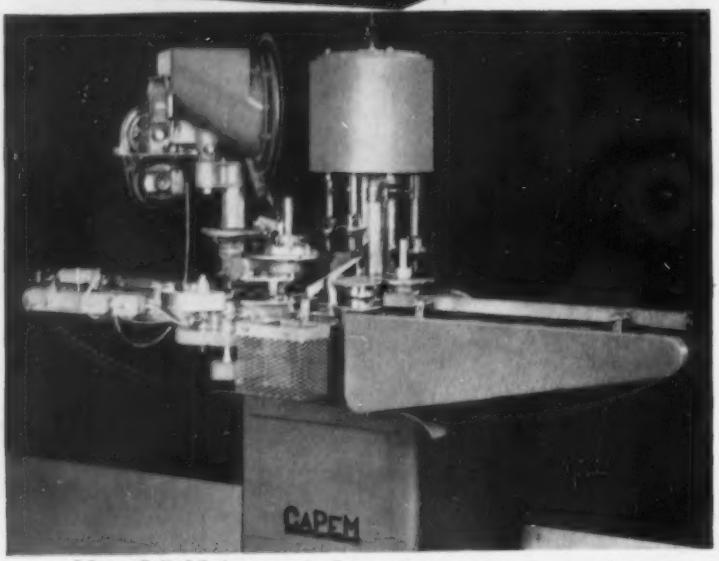
IF PACKAGING COSTS ARE
SKYROCKETING
CaPeM SCREW CAPPERS
WILL BRING THEM
DOWN



More CaPeM Automatic Screw Cappers are in use than any other make. And for very good reasons. They combine low initial cost, low operating cost and a minimum of maintenance expense.

MEET EVERY PACKAGING REQUIREMENT

Eight standard CaPeM models accommodate a broad range of standard sizes and shapes of both containers and caps, as well as a wide variety of flexible molded closures of the CT type, both in combination with polyethylene squeeze bottles and otherwise.

In addition, advanced types of CaPeM machines are adapted for sorting, feeding and applying Wheaton and similar type closures, Kimble-type polyethylene plugs, polyethylene fitments, corks, etc., and in combination with a wide variety of secondary closures.

CaPeM is fully automatic . . . delivers a uniformly dependable seal . . . handles bottles, cans, jars and jugs from 2 ozs. to gallons . . . applies all types of metal and plastic screw caps . . . is easily synchronized with all standard types of related equipment.

Write for specifications and the name of your nearest Consolidated representative. You'll find his broad experience with all types of packaging problems helpful.

CONSOLIDATED PACKAGING MACHINERY CORP.
1400 West Ave., Buffalo 13, N. Y.

the diced potatoes with cooked peas (6.25% peas and 18.75% potatoes). Too, try adding 0.005 to 0.10% paprika.

Lamb Stew—Lamb (1-in. cubes), 31.87; diced potatoes, 29.75; hot water, 17.00; diced turnips, 8.50; peas (cooked), 4.25; sliced onions, 4.25; tomato puree, 1.70; shortening, 1.25; flour, 0.85; salt, 0.50; and ground pepper, 0.08.

Kidney Stew—Beef kidneys (1-in. pieces), 27.50; water, 27.50; diced potatoes, 13.70; canned tomatoes (drained), 13.70; diced onions, 5.43; sliced carrots, 3.40; butter or margarine, 3.40; chopped celery tops, 3.30; barley (medium), 1.65; salt, 0.28; and ground pepper, 0.14. Also add, to suit, crumbled bay leaves.

Now for processing instructions:

In making beef stew, brown meat in kettle with shortening. Add a little less than half the hot water (about 7%), and simmer until meat becomes tender. Cook in another kettle the potatoes, carrots, and onions in remaining 10% hot water until vegetables become tender. Then add to kettle with cooked meat.

Make a paste with flour and cold water, add to stew, and heat, with agitation, until batch becomes thick. Season with salt and pepper, and simmer (about ½ hr.). Cool to 120-130 F., add Worcestershire sauce or cooked peas, fill into suitable container, and freeze.

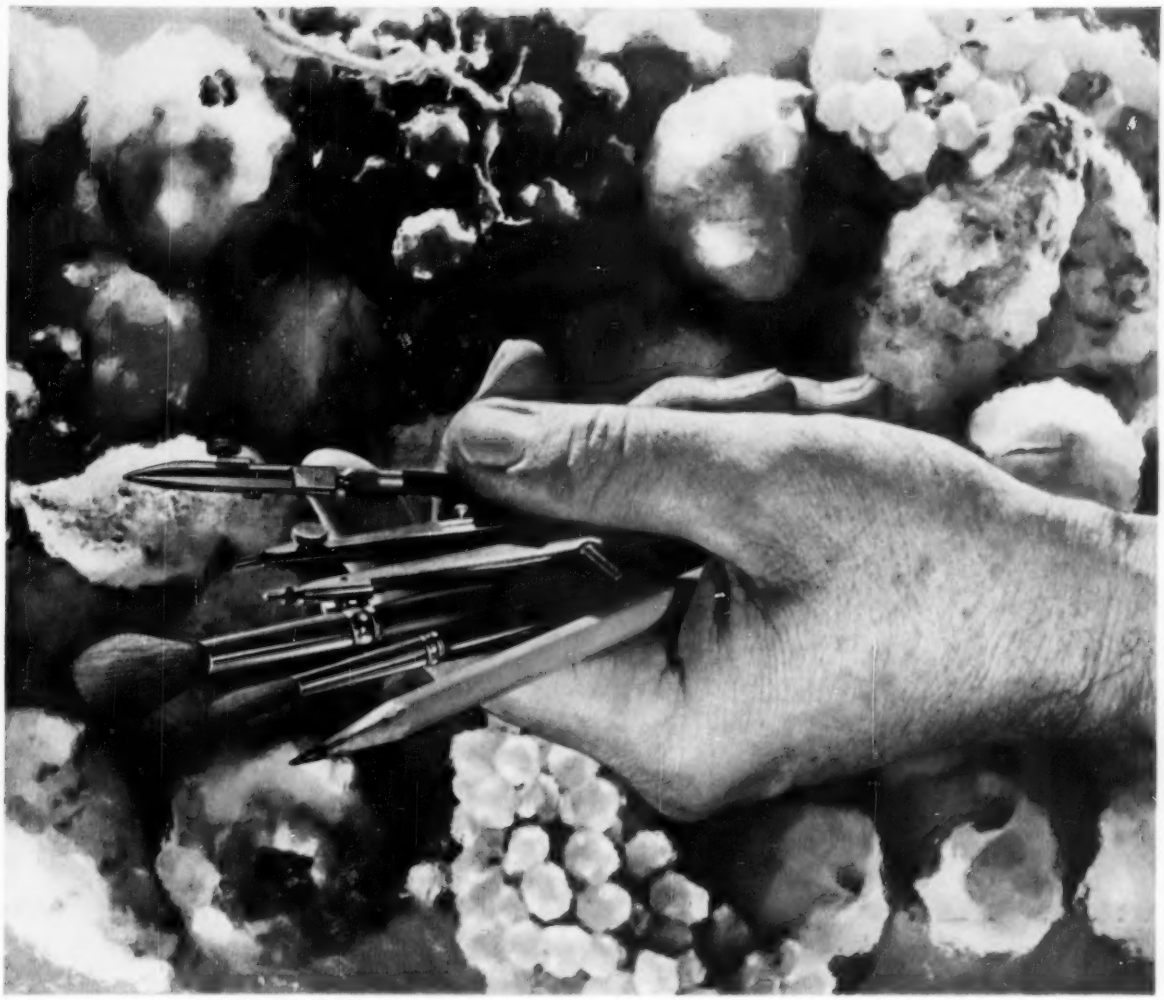
Lamb stew is prepared by browning (about half browned) the lamb and shortening in a kettle, and then adding sliced onions and salt. Now add pepper and flour, and slightly brown. Introduce hot water and tomato puree, and simmer until tender (over 1 hr.).

In separate kettle, cook until tender, the potatoes, carrots, and turnips. At last minute, add cooked vegetables to stew. Skim excess fat from stew. Cook batch, fill into containers, and freeze.

Make the kidney stew by soaking washed barley for over an hour in the water. Skin, fat, and tough membranes must be removed from kidneys before cutting them into pieces.

Brown kidneys in butter or margarine. Add onions, and cook an additional 5 min. or so, with agitation. Add water and soaked barley, salt, tomatoes, pepper, and bay leaves. Cover kettle, and simmer 1 hr. (or until barley and kidneys are tender).

Now add potatoes, carrots, and celery tops. Simmer about ½ hr., or until vegetables are tender, adding more water if necessary. Cool batch, fill into containers, and freeze.



New Protection for Perishables

through creative design in kraft packaging . . .

by **FROSTKRAFT**

5000 lbs. sit solidly on top of four new FROSTKRAFT produce boxes . . . positive demonstration of the stacking strength built into tough - tempered FROSTKRAFT containers.

FROSTKRAFT'S rugged new container for perishable produce is now in production. Here is the box that beats all competition in the battle against loss by damage. This new box is of all-kraft construction. Not one ounce of its structural strength depends upon other, more expensive materials. It can be set up by unskilled labor in less than one second . . . no taping, stapling or gluing is required.

Engineered to industry-high standards, FROSTKRAFT designs are adaptable to any product. If you require kraft packaging of superior strength, you will find what you need in FROSTKRAFT'S complete range of tough-tempered containers, bags and multiwall sacks. Call us today.

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for Better Conditioned, Finer Flavored Foods

OK DRI-SWEET 42 D.E. (COARSE) is especially suitable for seasoning comminuted luncheon meats, smoked, cured and preserved meats. It is colorless, reduces watering off, cuts shrinkage, improves texture, is a better binding agent and can be used in greater quantity for maximum fill.

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Saving Power $ $ $

—Continued from page 73

under the fuel bed, used for secondary air, was found to be clogged with cinders. Residents near the plant complained bitterly about the smoke. After the cinders were removed, smoke disappeared completely and the neighbors were happy. But best of all, fuel bills dropped dramatically.

18 **Don't permit excessive air.** While too much air won't cause smoke, it does cool down the furnace, necessitating more fuel to keep temperatures up. Check dampers on your boiler. If you have no Orsat instrument for keeping track of combustion gases, start closing dampers while keeping a close watch on the stack. When a light brown haze appears, that's it—the perfect setting.

19 **Don't let scale foul your boilers.** Boiler feed water must be chemically treated, otherwise the boiler will scale up. Then smokestack temperature rises, because hot gases on the fire side of the boiler can't transfer heat through the scale. If this is allowed to continue, the furnace tubes will even burn out.

Put in a good feed-water treatment system. Give boiler blowdowns as recommended by the treatment firm. This removes solids from boilers so they will not settle on heating surfaces.

20 **Don't neglect preventive maintenance.** Trouble source in many plants is equipment that's kept running with little attention. Then one day a unit just gives up and breaks down completely.

This can be avoided, and life of machinery greatly extended, with frequent, relatively inexpensive checkups. For this you need a good mechanic. Have this man set up a routine system for thoroughly inspecting all equipment at set intervals. The little things he finds—and fixes—during these checkups will save you big repair bills.

21 **Don't tolerate operator inertia.** Last, but far from least, is the problem of selling your program to production personnel. These workers can avoid many or all of the aforementioned pitfalls. But they must be interested. Fortunately, they usually are after management explains the vital importance of the program.

End (*Resume reading on page 73*)

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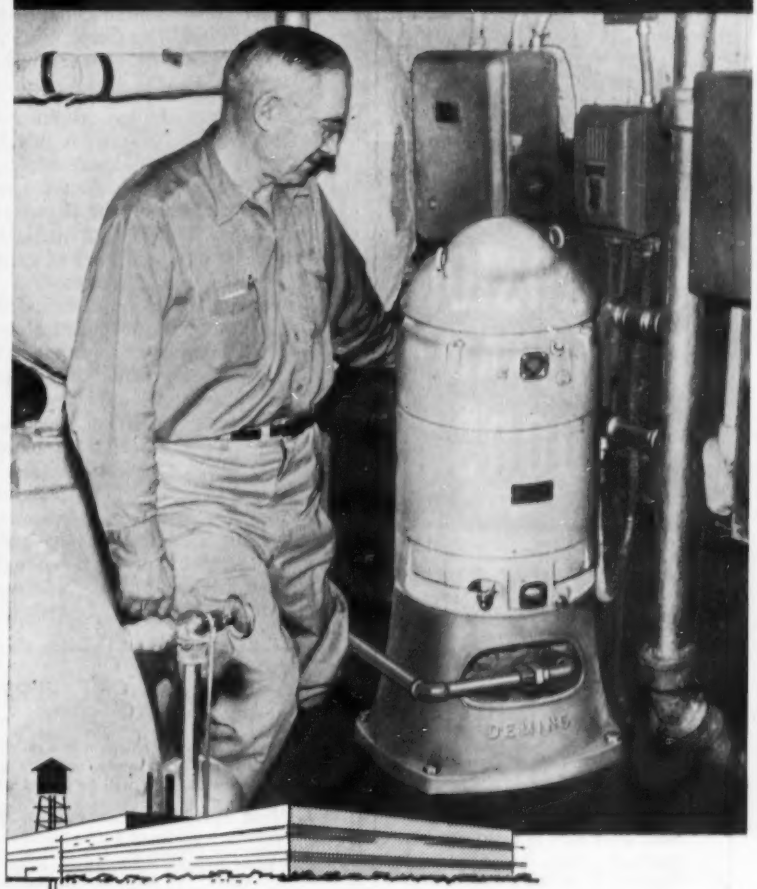

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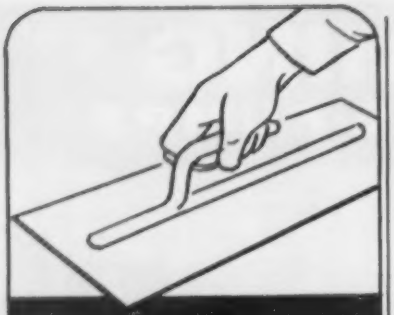

Trowel on

CORROSION RESISTANT FLOORS

with your own plant labor

New Chemi-Top floor surfacing compound gives you a dense, non-porous, rock-hard floor that withstands impact, wear and corrosive action. Chemi-Top Floors outwear other acid-proof floors, cost much less.

Chemi-Top Floors are chemically inert, won't react to acids, salts, oils alkalis or grease. Spilled industrial chemicals, brine, inks, greases or dyes can be wiped up without even a stain. Chemi-Top is excellent, too, for surfacing drains, tank linings or walls.

Four times tougher than concrete, Chemi-Top has a compressive strength of 40,000 to 50,000 lbs. PSI as against 10,000 to 14,000 for the best concrete.

Plant labor can apply. Prepare floor according to directions, then trowel on a layer ⅛" thick. You'll get a smooth, burnished floor that is slip resistant and easy to keep sanitary. Added floor height around drains, sills and equipment is neglible.

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USEFUL NEW BOOKS & GOVERNMENT PUBLICATIONS

Tech Man's Reference

CONDENSED CHEMICAL DICTIONARY. *Reinhold Publishing Corp., 430 Park Ave., New York 22. 1956. 1200 p. Price:* $12.50.

A valuable addition to the food technologist's book shelf is this 5th edition of an established reference book. Over 30,000 entries are said to make this edition the largest and most complete chemical dictionary in both number and kind of entries as well as information offered.

Included is data on chemical and physical properties of chemicals and raw materials, newest information on containers, shipping regulations, and safety instructions, new uses of chemicals and nuclear energy, chemotherapy, and other fields of current interest. Cross references aid in clarifying confusion often associated with chemicals and their synonyms.

Leading manufacturers have supplied the publisher with up-to-the-minute information on trade name and trade-mark products. Many of these have recently been placed on the market, some are still in the pilot plant stage. For the technologist who wants a quick and accurate data finder, this book is a must.

British Packaging Guide

PACKAGING CATALOGUE OF GREAT BRITAIN *(10th edition). Published by the Tudor Press Ltd., Tudor House, 75, Carter Lane, London, E. C. 4. 1956. 192 p., paper. Price:* 17/6*d* ($2.50). 8¾ x 11 *in.*

This 1956 edition of an annually revised directory is reported as the only guide of its kind to the British packaging trade. Its classified section offers over 1,000 different headings under packages, materials, machines, equipment and services.

Also included is an alphabetical list of firms complete with management personnel and addresses and a comprehensive directory of trade names.

FE REPRINTS AVAILABLE

Listed below are special sections, flowsheet book, and articles from past issues of FOOD ENGINEERING which are available in reprint form. Single-copy prices are listed. For orders of 20 or more, there is a 25% discount. To order reprints, use coupon at bottom of page. You will be billed when your order is filled.

1. Meat Special $1.25
Contains a series of 9 articles: (1) Cold Sterilization Problems. (2) New Continuous Lard Process. (3) Progress in Meat Dehydration. (4) High-Speed Chub Packaging. (5) Atomic Irradiator Designed. (6) Improvements in Unit Tanks. (7) New Processes for Old Products. (8) Map Unravels Delivery Snags. (9) Saves 50% of Retort Steam.

2. Dairy Special $1.25
Ten timely articles are included: (1) Dairymen Face Challenging Changes. (2) New Processes for Instant Dry Milk. (3) Controls Presage Automatic Dairy. (4) Save With Cleaned-in-Place Pipes. (5) Bi-Oxidation Solves Waste Problem. (6) Cheese Keeps in Antimycotic Wrap. (7) Plastic Tank for Milk Trailers. (8) Bulk Handling Aids Processors, Too. (9) Advanced Dry Milk Flowsheet. (10) "Tracers" Detect Foreign Fats.

3. Ingredient Special $1.25
Ten articles helpful in improving product formulation: (1) Chemicals Still a Question. (2) Role of Antioxidants. (3) MSG—Unique Enhancer. (4) Tailored Salts Add Values. (5) Ascorbic Acid Betters Meats. (6) Dry Solubles Are Versatile. (7) Sugar Types and Uses. (8) Latest on Low Calories. (9) True-Fruit Hows and Whys. (10) Stepping Up Nutrition.

4. Packaging Special $1.25
Six articles of practical value: (1) Flexibles Are Revamping Packaging Pattern. (2) How to Avoid Damage in Shipping. (3) Bundling Frozen Foods. (4) One-Portion Packets. (5) Automatic Packaging Line. (6) Paper Vs. Glass.

5. Canning Special $1.25
Eight articles on significant developments: (1) High Frequency Looms as Improved Cooking Method. (2) New Twist in High-Short Retorting. (3) Full-Flavor Concentrates by New Recovery Techniques. (4) From Orchard to Cannery—Under Water. (5) at Gerber's, Quality Control Reigns Supreme. (6) Bulk Brining Spells Big Benefits to Canner. (7) Top-Notch Tomato Processing Operation. (8) Dual Tomato Cannery—How It Ticks.

6. Heat Process Nomograph....$.50
Limited number of special FE foldout nomographs for heat processing (p. 47, this issue) are available. Device speeds computations in thermal engineering of liquid and solid food heat exchangers.

7. Preventive Maintenance $5.00
An 8-pager packed with information that will help to minimize costs, reduce down-time, and promote quality through more effective maintenance.

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Maintenance Pointers

PLANT OPERATORS' MANUAL *By Steve Elonka. Published by McGraw-Hill Book Co., 330 W. 42nd St., New York City 36, 1956. 281 pages. 6¾ x 10 in., cloth. Price:* $5.

This profusely illustrated book provides the food man with a compact and up-to-date reference that will serve as a guide to plant maintenance.

It covers everything from boiler construction and care to valve designs and repair. A thorough guide to power service operation and maintenance, it discusses boilers, steam engines, turbines, diesel engines, pumps, and compressors.

Practical application is the keyword. For example, detailed instructions are offered on such jobs as charging a Freon compressor and overhauling a bearing.

Food industry management will find the manual a valuable addition for handy desk reference.

Handling Plant Waste

PROCEEDINGS OF THE TENTH INDUSTRIAL WASTE CONFERENCE. *Published by Engineering Extension Dept., Purdue University, Purdue, Ind., 1956. 6 x 9 in., paper. Price:* $2.50.

Book is a collection of papers presented at the recent industrial conference by Purdue University and the Indiana State Board of Health.

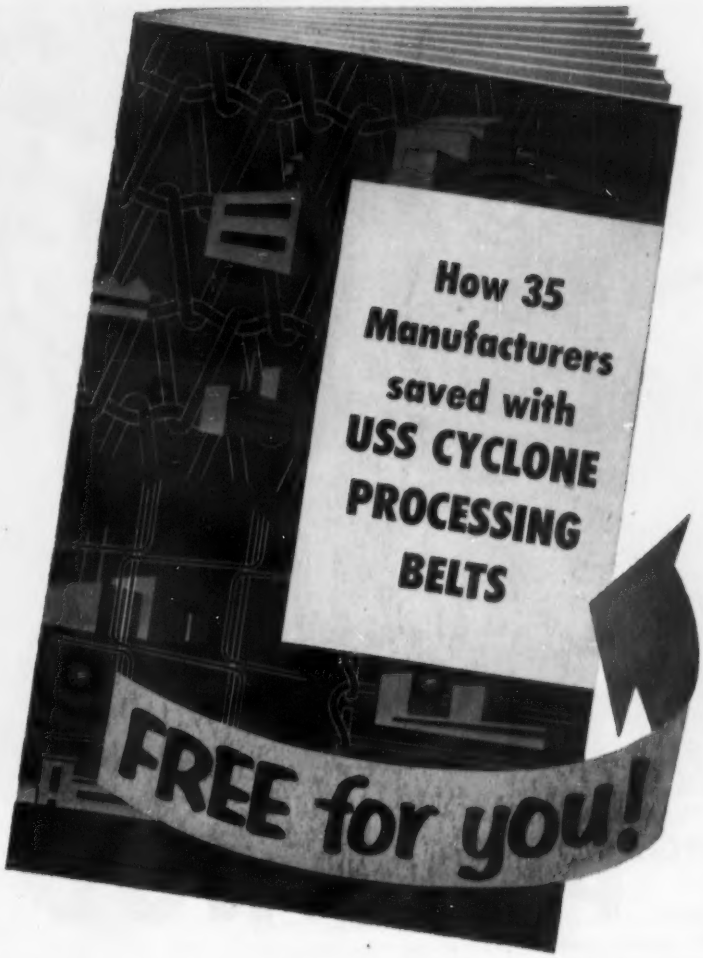
Many of the papers presented are of specific interest to food processors. For example, there are reports on aeration methods applied to dairy wastes, spray irrigation of canning plant waste, aerobic oxidation of corn wet milling wastes, and others.

The book also contains an index to all ten of the waste conferences.

Two 1956 Issues

TECHNIQUES OF PLANT MAINTENANCE AND ENGINEERING, 1956. *Published by Clapp & Poliak, Inc., 341 Madison Ave., New York City 17. Price:* $10. Proceedings of a conference held at the Plant Maintenance and Engineering Show, it contains text of 16 papers, summaries of 15 roundtable discussions and answers to approximately 1100 specific questions.

MANUAL OF SUGAR COMPANIES, 1955/56. *Published by Farr & Co., 120 Wall St., New York City 5. Price:* $3.00. Descriptions of important sugar companies, data on common and preferred stock of various companies and dividends paid, and



A book on production line savings...

Here are specific stories of how thirty-five prominent manufacturers managed to cut down on production costs by using Cyclone Processing Belts. In each case, costs slid down when Cyclone Processing Belts started up.

Send for this *free* booklet illustrating actual techniques and uses of production line methods. It's chock full of ideas that add up to dollar and cents savings. We've chosen each example carefully to cover as many fields as we could. You'll find Cyclone Processing Belts used in acid, heat, water, brine and many other operations. Just clip the attached coupon and mail it. It will pay you to do it . . . TODAY!

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PECTINOL enzymes are effective in producing juice of sparkling brilliance, and facilitating the extraction of juice from pulpy fruits.

The improvement in processing efficiency is considerable. For example, it may increase yields of juice as much as 7 percent in crushing. And it increases filtering capacity up to 500 percent. These savings are usually more than enough to cover the cost of PECTINOL—about ½ cent per gallon of clarified juice.

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statistical tables of acreages harvested with international sugar production data.

New Business Service

Consultant Reports, a new service designed to get practical comprehensive information to businessmen in time for decision making, has been announced by McGraw-Hill Book Co., 330 W. 42nd St., New York City 36.

Begun July 16, 1956, the service will reflect the experience of specialists in various areas of management. First report examines the problem of expanding business. Second report will deal with contemporary techniques of business forecasting.

Issued at intervals during the year the Consultant Reports are available individually at $15, also subscription plan at $12.50 each.

More Vacuum Data

1955 VACUUM SYMPOSIUM TRANSACTIONS. *Published by Committee on Vacuum Techniques, Inc., Box 1282, Boston 9. 1956. 101 p. 8¾ x 11¼ in., cloth. Price:* $10.

This is the second report of a group formed to deal with the dissemination of information on all aspects of vacuum technology.

The illustrated volume includes sections on fundamental developments in vacuum technology, application and processes, methods and techniques for obtaining high vacuum, standards and nomenclature. Each section is composed of papers presented at the 1955 symposium.

Booklets and Reports

THE USE OF CHEMICAL ADDITIVES IN FOOD PROCESSING. *Published by National Academy of Sciences, National Research Council, Washington 25, D. C. 91 p., paper. Price:* $2.00. Report by the Food Protection Committee of the Food and Nutrition Board.

MILKMAN'S ECONOMICS. *Published by Milk Industry Foundation, Washington 6, D. C. 24 p., paper. Price:* 50 cents. Story of milk processing and distribution costs.

COMPOSITION OF CONCENTRATE BY PRODUCT FEEDING STUFFS. *Published by National Academy of Sciences, National Research Council, Washington 25, D. C. 126 p., paper. Price:* $3.00. Report by Committee on Feed Composition, Agricultural Board.

Plastic-Body Trucks

—*Continued from page 91*

Fiberglas insulation. It is in the form of a quarter section of a cylinder set in horizontally. In its closed position, the lower edge of the barrel door rests atop the drop door below.

In operation, the barrel door is rolled up overhead by means of a pneumatic double-acting piston working through a lever (BK door-operating kit). Controls are on the dash.

Lower cases are reached via the drop door. In route work, 14 empty cases may be stowed beneath floor in driver's compartment and against the dash on curb side.

The bodies are mounted on various standard makes of step-in or Divco chassis. They are cooled by plates, which are refrigerated either by compressors on the trucks or at the plant.

The outer shell is molded in one piece—longitudinally from the rear bumper skirt, up the back and over to the top of the windshield, and transversely from side skirt (including fenders) over the top and down the other side skirt. Inside shell is formed the same way—including sides, back, and ceiling.

The inner floor, likewise molded in a single piece, is bonded to the inside shell, while outer floor bonds to outside shell around the floor perimeter. Rear door jamb is molded integral with the outside shell and is bonded to inside shell at assembly.

In manufacture, the bodies are assembled upside down. Starting with the outside shell in a jig, the framework is bonded in and top, back, and side insulation is installed. Next, the inner shell is bonded to the frame and rear door opening.

A sub-assembled floor section is then lowered into place, bonded to inner shell, and framework is bolted together. Finally, outer floor is placed and bonded to outer shell.

At the above stage, body is removed from jig, righted, and mounted on a modified chassis. Windshield cowl is now installed, also the service bulkhead, and both are bonded to shells and floors.

All of the plastic molded parts are manually laid-up, using Gel-Coat on finish-surfaces (only solid colors at present). Because of the large flat areas involved, molds are fixtured to present horizontal areas not subject to resin run-off.

Since the total bulk of such components is difficult to place in an oven, forced-air heating equipment is used in cycling large molds.

End (Resume reading on page 92)

RESISTS CORROSION

ELECTRICAL RIGID CONDUIT, made by Alcoa, will cross corrosion right off your trouble list ...for aluminum won't rust and resists corrosion even in contaminated areas. Excellent for exterior use. And it rarely needs painting.

Because aluminum is so resistant, so durable, so ideal for electrical rigid conduit, it is the best investment you can possibly make. It outlasts other conduit many times over . . . saves continuously on maintenance.

Moreover, it is nonsparking, nonmagnetic. It has the approval of Underwriters' Laboratories. Its nonmagnetic feature means less voltage drop, points the way to installation savings . . . for you can run longer lines or use smaller wires. And you can separate conductors regardless of load.

Get the complete details on good-looking, long-lasting Alcoa® Aluminum Electrical Rigid Conduit from your local Alcoa sales office. Or write Aluminum Company of America, 2328-K Alcoa Building, Pittsburgh 19, Pennsylvania.

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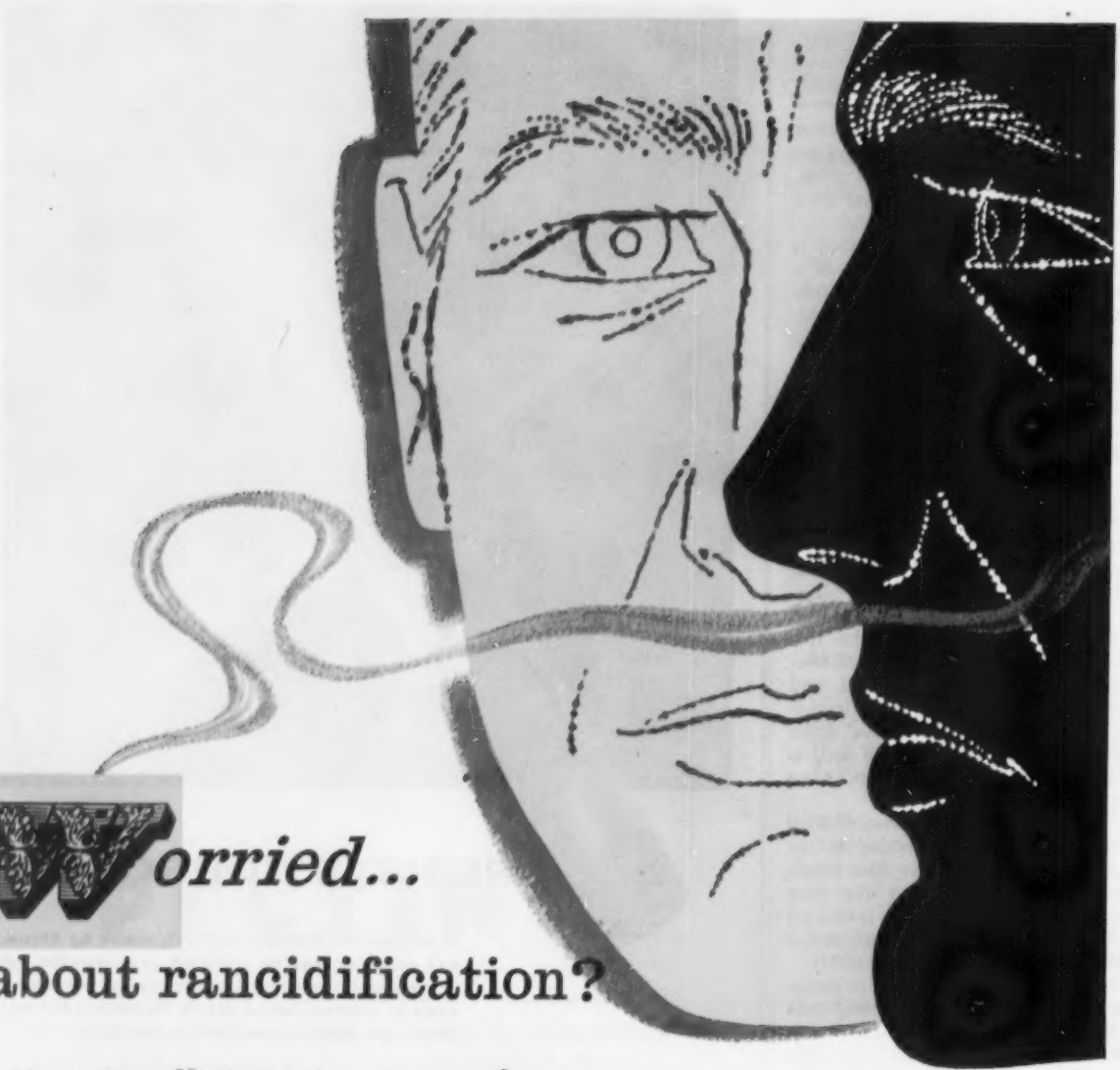

Worried... about rancidification?

New Ionol®, C. P.-impregnated cartons and wrappers protect flavor and aroma . . . *prolong shelf life*

YOU KNOW WHAT a serious, ever-present threat to shelf life rancidification is. Here's a new, simple, yet extremely effective way to combat it—Ionol,C.P. antioxidant.

Rancidity usually begins with fats and oils that have migrated to the surface of packaging materials. But, when boxboard and paper are impregnated with Ionol,C.P. antioxidant, they give dependable protection to aroma and flavor by effectively preventing oxygen attack on fats.

In actual tests, baked goods were stored at 85°F in Ionol,C.P.-impregnated boxboard cartons, which were found to be free of rancidity at the end of ninety days. Without Ionol,C.P. protection, packages of baked goods stored under similar conditions often develop rancidity within a week.

You can insure long shelf life and protection of your brand label's good name by asking for packaging materials containing Ionol,C.P. antioxidant. Write to Shell Chemical for names of suppliers of new Ionol,C.P.-impregnated packaging.

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KEEPING UP WITH THE FIELD

TECHNICAL NEWS • WASHINGTON HIGHLIGHTS • ECONOMIC TRENDS • LABOR DEVELOPMENTS

Begins Seafood Study

Basic research on chemistry and biochemistry of fish gets underway in a new laboratory of seafood technology at U. of California, Berkeley. Shown examining a Yellowfin Tuna are Harold S. Olcott (left), head of the lab and professor of food technology, and Eystein Einset, U. S. Fish & Wildlife chemist.

Vitamin Gaged in 'Dairies'

Milk and cheese have now been carefully analyzed for vitamin B_{12} content, reports USDA. And the tests show that this vitamin—vital to human health—does not vary in milk from different breeds of cows. Also, pasteurization has no significant effect on the percentage.

Among cheeses tested by the scientists, natural Swiss cheese proved especially high in the vitamin. Natural chedder cheese ranked second.

New Pineapple Enzyme

Limited commercial production of a protein-digesting enzyme, extracted from the pineapple plant, has now been started in Honolulu, states Hawaiian Pineapple Co., Ltd.

The new compound, called bromelain, has important industrial and medical uses, and is expected to become a sizable source of income for Dole.

Additives Blasted, Upheld At Rome Cancer Meeting

Safety of food additives has long been a subject of furious debate between government, medical, and food experts. And it is raging again, as a result of a recent symposium by the Research Committee of the International Cancer Control Union in Rome, Italy.

Dr. Arnold J. Lehman, Chief of FDA's Pharmacology Division, told the gathering that no food additive presently used in the U.S. will cause cancer.

"Decisions regarding the safety of a proposed additive involve many considerations, and include carefully designed experiments and a critical analysis and interpretation of the data", he continued. And a given additive is considered safe only "if the maximum safe dose in long-term animal-feeding studies is at least 100 times the amount that may occur in the total human diet".

But the cancer specialists—including several American delegates—declared that a number of food additives used in Europe and the U.S. constitute a "serious public health problem". They drew up a unanimously approved list of coloring substances and other chemicals that can be added to foods in any quantity with complete safety. Another list contains substances that should be used in moderation. Other food additives were labelled unsafe until their properties can be more thoroughly investigated.

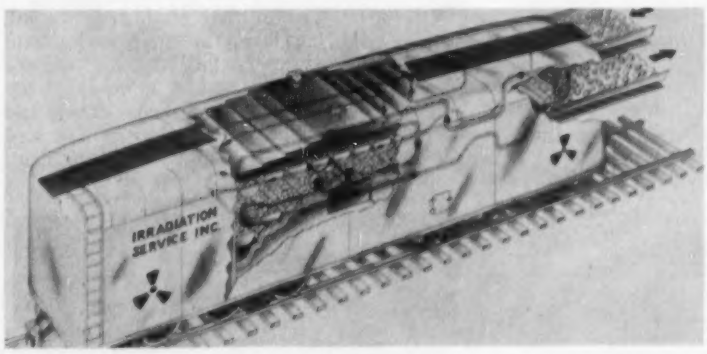
The Committee report, however, is subject to review by the International Cancer Control Union. And it is possible that some conclusions will be modified before results are transmitted to the various governments—to serve as a recommended basis for control laws.

Canada OK's Fish Antibiotics

Treatment of fresh seafood with Aureomycin (chlortetracycline) to increase storage life and cut spoilage has won formal approval from the Canadian government.

Specifically, fisherman will now be permitted to add 4.5g. of the broad range antibiotic (before freezing) to each 300-lb. cake of ice used to preserve fish on trawlers and during transportation.

Process is expected to drastically cut the 23% spoilage that now occurs before fish reach market.



Proposes A-Ray Car for Treating Foods

Irradiation of potatoes, grain, and citrus fruits to curtail sprouting and insect infestation is now feasible with this proposed rail-car-mounted atom-ray device, states Professor L. L. Brownell, U. of Michigan engineer. The 173-ton unit would cost $93,400 to build and $114,000 per year to operate. Handling from ½ to 11 tons of product per hour (amount depends on dosage), cost to users would range from $2.55 to $40.80 per ton, he adds. Source of gamma rays for the mobile unit is spent fuel elements from nuclear reactors. "Irradiation Service, Inc." is a fictitious name. (Authenticated News photo.)

FDA Revamps Administrative Structure To Pave Way for Big Expansion

Following a recommendation of the 1955 Citizens Advisory Committee (CAC), FDA has scrutinized its organizational structure. As a result, it has created four new bureaus to streamline operations and prepare for the 3- or 4-fold expansion that the CAC urged be carried out over the next 5 to 10 years.

As far as food plant men are concerned, the changes will be barely noticeable. There has been no reassignment of personnel at the divisional level—where most food plant contacts are made. And authority of divisional officers to act on cases remains unimpaired.

But the revamping will make a good deal of difference in present and future FDA efficiency by freeing Commissioner Larrick and his office staff from a good deal of administrative routine.

Where formerly, chiefs of the Agency's eleven operational divisions reported directly to the Commissioner or his Deputy on day-to-day problems, they will now consult one of the new bureau chiefs. These men—two former Associate Commissioners and two Divisional Directors—will check with Commissioner Larrick only on particularly knotty problems.

With the new set-up, the Bureau of Biological and Physical Sciences (under former Associate Commissioner R. S. Roe) consolidates the Agency's seven technical divisions (including food) into a single administrative unit.

And a new Bureau of Enforcement (former Associate Commissioner M. R. Stephens) takes over regulatory management—thus combining the functions of label review, replies to manufacturer's queries, and consultation with industry on labelling questions.

The remaining two divisions are changed in name only. The Division of Field Operations becomes the Bureau of Field Administration (still under A. E. Rayfield). Similarly, Division of Medicine is converted into Bureau of Medicine (with Dr. A. H. Holland still at its head).

Army Forms A-Ray Group

A new agency has now been set up by the Army to plan operation of its proposed ionizing radiation center (FE Aug. p. 165). Personnel, who will function under the Quartermaster Research & Development Command, Natick, Mass., are to be based at the Office of the Quartermaster General, Washington, D. C., pending selection of a site for the food preservation facility.

Selected as Acting Technical Director for the new group is Captain Reuben Pomerantz, former Radiation Preservation Officer at the Food & Container Institute, Chicago.

Chilled Juice Still Growing

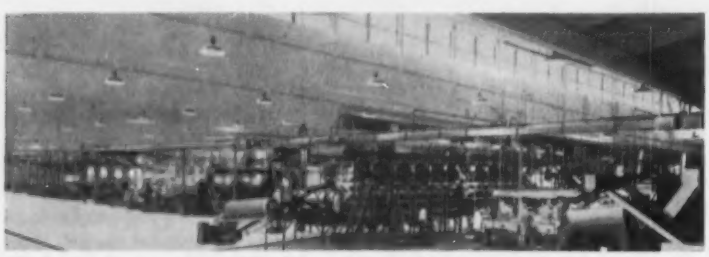
Production of chilled orange juice will require 6,500,000 boxes of oranges during the coming pack—a sharp increase of 1,500,000 boxes over the 1955-56 season, declares Florida Citrus Mutual.

Furthermore, a large amount of California juice, and an estimated 4,500,000 gal. of Florida orange concentrate will be used to make the cartoned product during the 1957 Summer months, Florida's "off" season.

Will Publish Science Work

Modern developments in scientific and technical knowledge are now being concentrated into a single, comprehensive set of books—a job that will take three years—by the McGraw-Hill Book Co.

This vast publishing endeavor will be made up in encyclopedic form from several thousand cross-indexed articles, written by some 2,000 top experts in various engineering and scientific fields. Material will be kept up-to-date by an annual supplement.



Rebuilds Burned Plant With Record Speed

Just 100 days after fire destroyed their old plant, Northwest Packing Co., Portland, Ore., opened the doors on this new $1,500,000 cannery—an outstanding example of speed and cooperation by 33 suppliers and contractors. Here, panoramic view shows cutting, grading, and inspection steps on bean processing line.

ICC Stays Demurrage Hike

Increased demurrage charges, recently sought by the nation's railroads, have now been held up for seven months by the ICC, according to the National Assn. of Refrigerated Warehouses (NARW). Action was taken after protests from over 300 shippers and shipping groups were filed with the Commission.

Car shortages—which the railroads claim would be alleviated by the higher rates—are frequently the result of a railroad's failure to provide switching and clerical services on Saturdays, Sundays, and holidays, states NARW. And cars are often not delivered on time.

Union Fights Automation

A five-point program has been adopted by the International Union of the United Brewery, Flour, Cereal, Soft Drink, and Distillery Workers of America to combat what they term "the problem of increased productivity" in the brewing industry.

The final report, from the Union's 34th convention, urges increased pressure for higher wages, shorter hours, longer vacations, steady employment, and a guaranteed annual wage. "Even though we cannot halt progress or invention", the members declared, "we must initiate a program that will permit more and more people to share the benefits of increased production".

Frozens Up 11% Over '55

All things point to another big year for frozen foods, according to Richard M. Page, President, National Frozen Food Distributors Assn.

A recent poll of NFFDA members showed that 80% are doing better sales-wise in the first six months of '56 than they were doing during the same period last year. The actual business increase is estimated at 11%.

This may not reflect the true situation, though, President Page continued, because some foods—such as frozen meats and prepared foods—are "in an explosive growth stage". They are undoubtedly running considerably ahead of this figure.

HORS D'OEUVRES

▶ Prosperity promotes lower fecundity among individuals, alleges a British zoologist. Apparently he hasn't made a recent diaper count among young American families.

▶ **At the wartime peak of 1944, the percentage of housewives with outside jobs was 25.6. Now it is 29.5%. Coupled with a 40% boost in average family income since 1946, this double-life trend among housewives means more business for easy-to-prepare foods.**

▶ Despite the yen for convenience foods, homemakers want to think of themselves as being good cooks. So they go for foods requiring just a little kitchen processing, such as brown-and-serve rolls. In other words, the little lady still likes to "play house."

▶ **These items are being written with a coffee-break pencil that has the instant beverage in a transparent plastic barrel—a promotional gimmick that brings food convenience to a sharp point.—Time out, while we stir.**

▶ Areas stricken by natural or military disaster may have water from a new, safe source. The Civil Defense Administration is enlisting the aid of dairies to package water like milk for such emergencies Next best thing to dehydrated water.

▶ **A Hollander has invented a revolving-clothesline affair to swish fish through the air and speed drying. Why not just toss them into a modern automatic clothes dryer?**

▶ Some 4,000 items were exhibited by 335 manufacturers at the recent New York specialty food show. And orders reportedly were booked to the tune of $205,000 for such imported tidbits as Napoleon rum cakes and wild boar in wine sauce. Maybe more American food manufacturers should endeavor to brush the fancy-food tooth.

*Trona is the trade mark of American Potash and Chemical Corporation.

1 HIGHEST PRODUCTION AT LOWEST COST 2 EASY FINGERTIP CONTROL 3 METAL TO METAL SEALS
4 COMPLETE CHOICE OF MATERIALS 5 RUGGED RUNNING GEAR 6 MODERN SMOOTH DRIVES
7 ANTI-FRICTION BEARINGS 8 DESIGNED TO DO THE JOB 9 UNCOMPROMISED PRECISION

STANDARD STEEL CORPORATION

THE STANDARD FOR 54 YEARS

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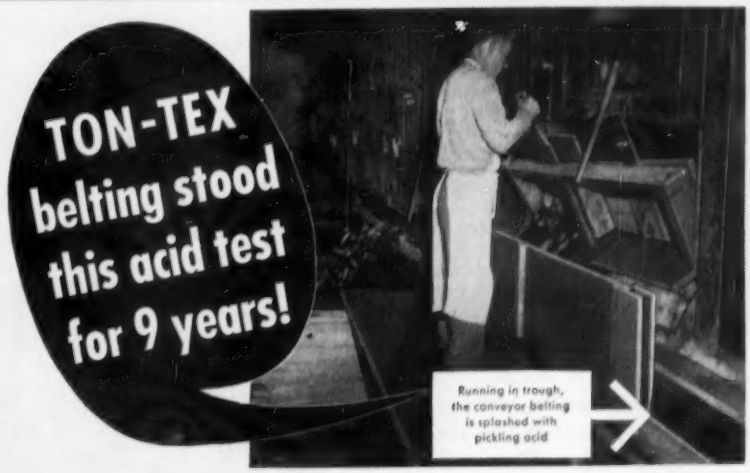
STANDARD HERSEY DRYERS

PILOT TESTING



This pickle plant found there's a difference in acid-resisting conveyor belts. They tried many types to convey pickles to tanks, but acid soon ended their usefulness. Then they tried a Ton-Tex belt of tightly woven plies of cotton specially treated. *That belt stood the acid test for 9 years!* A similar Ton-Tex belt then replaced it. If you process or can foods, Ton-Tex belting can cut conveying costs. Let our engineers help select the *right* belt for your job.

● Conveying costs increased by moisture, heat, acids, oils? Ton-Tex belts will solve your problem . . . save money!

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TON TEX

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CASTERS AND WHEELS

Always
SWIVEL
and ROLL

RUBBER TREADS . . a wide choice of treads suited to all types of floors, including Darnelloprene oil, water and chemical-resistant treads, make Darnell Casters and Wheels highly adapted to rough usage.

RUST-PROOFED by zinc plating, Darnell Casters give longer, care-free life wherever water, steam and corroding chemicals are freely used.

LUBRICATION all swivel and wheel bearings are factory packed with a high quality grease that "stands up" under attack by heat and water Quick grease-gun lubrication provides easy maintenance.

STRING GUARDS Even though string and ravellings may wind around the hub, these string guards insure easy rolling at all times.

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192 pages of helpful information Here is a book that should be in your files

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Canned-Food Retail Sales Analyzed in New Study

Processors, distributors, and retailers of canned food have now gained a valuable yardstick for measuring the rate of sale and sales potential of their products or stock from a comprehensive merchandising study, conducted jointly by the National Canners Assn. and American Stores Co. in Philadelphia.

First report from this ambitious Philadelphia Project—a detailed, 53-p. analysis of canned vegetable retail sales—provides food men with a basic guide to help them coordinate shipping and inventory volumes, and plan production of products by style of pack and can size.

The report charts sales in ten Acme stores over a twelve-week period, and it breaks them down into four major categories: (1) Average sales per 1,000 customer checkouts, (2) weekly sales per 1,000 checkouts, (3) weekly sales per selling foot of shelf space, and (4) relative sales for each style of product and can size.

It was discovered that four products—baked and cooked beans, peas, corn, and tomatoes—account for over 50% of total vegetable dollar sales. Further, all canned vegetables amount to 3.3% of total store sales, and 5.7% of the dollar value in an average grocery purchase.

Other reports on products, merchandising technique, and seasonal variation studies will be issued for these and other canned food in the future.

Canada Bars 3 Colors

The Canadian government has approved an order banning use of Orange 1, Orange SS, and Oil Red XO—three coal tar dyes—in or on any food sold in the country. The regulation is effective as of last month for fresh fruit and fish. Processors of other foods have until Aug. '57 to comply.

The colors, designated in the U.S. as FD&C Orange 1 and 2, and Red 32, are reported to have caused damage and death to test animals, and illness in humans.

Cable Loads Trailer-Ship

A unique truck-trailer loading device that reportedly eliminates need for tractors is feature attraction on a giant new trailer ship, now under construction at Jacksonville, Fla.

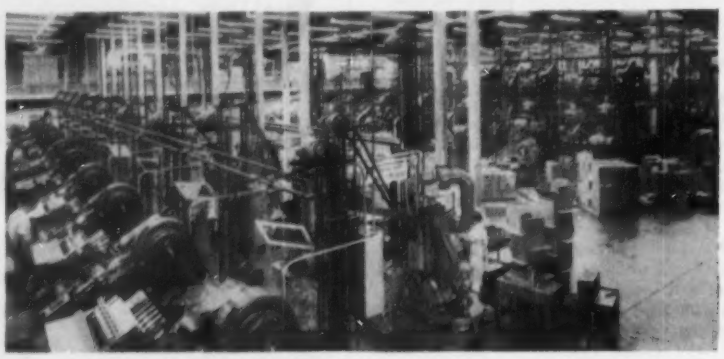
The new system utilizes four tracks to guide the trailers and a dolly fastened to an electric-powered cable to pull carriers into position.

The ship, owned by TMT Trailer Ferry, Inc., Miami, will carry 92 trailers, 97 automobiles, and 500 tons of general cargo between Florida and Puerto Rico, Virgin, Windward, and Leeward Island ports.

Diversity Gives Top Sales

Importance of convenience foods and diversified products was stressed recently for General Mills stockholders by Harry A. Bullis, Chairman of the Board.

In 1938, flour accounted for 74%



Processor Completes Own Can-Making Plant

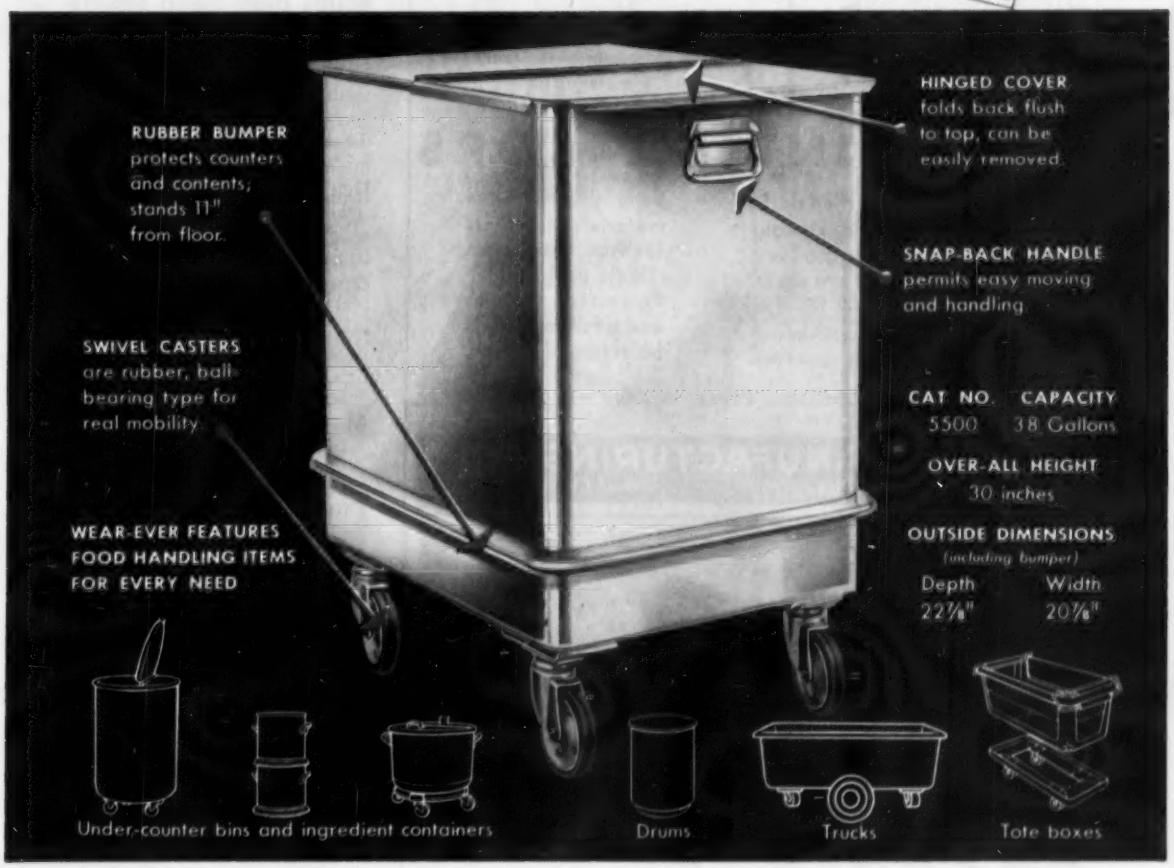
Just put into full operation is this modern, $2,500,000 can-making plant—designed, owned, and operated by Dole Pineapple Co., Honolulu. Capable of handling all the company's needs, the new 8-line facility is expected to turn out 365,000,000 cans per year. Dole announced its intention to manufacture containers in late '54, after an intensive survey showed that the company could reap substantial savings by making its own cans.

... now ... 33-1/3% more capacity ...

in this new rectangular, mobile under-counter type

BIN
by WEAR·EVER

WEAR-EVER ALUMINUM TRADE MARK REG. U.S. PAT. OFF.



We've "squared away" the conventional round container, to give you ⅓ *more* carrying and storing capacity, *in comparable over-all size.* Think what this can mean to you in faster handling, fewer refills, greater utility.

Quality's the same, of course, as in all Wear-Ever Aluminum food handling items. Extra hard-wrought dent and scratch resistant alloy. Seamless construction. Smoothly rounded, easy-to-clean inside corners. Sanitary flared rim.

Naturally, we've designed this new container for a perfect fit under your standard cook's and baker's work tables —same as the round type.

Like to see a sample? Pick up the phone and ask your Wear-Ever man to wheel one over. Or send coupon for full details on our complete food handling line.

WEAR·EVER ALUMINUM UTENSILS

THE ALUMINUM COOKING UTENSIL COMPANY, INC.
WEAR-EVER BLDG., NEW KENSINGTON, PENNSYLVANIA

The Aluminum Cooking Utensil Company, Inc.
310 Wear-Ever Building, New Kensington, Pa.

GENTLEMEN: *I'd like to know more about your new rectangular under-counter bin.*

☐ Send me your catalog. ☐ Have your representative see me.

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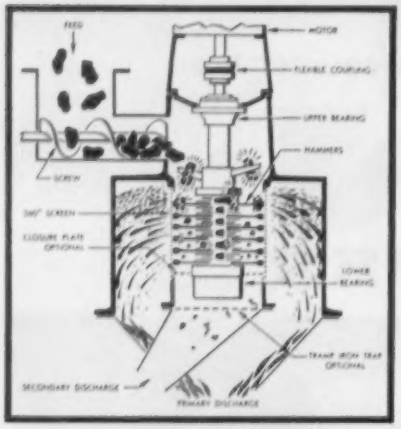

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Permits secondary discharge of disintegration-resistant material.

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Sanitary and Industrial Models In Both Vertical and Angle Designs
SPEEDS: 1200 RPM to 16,000 RPM
CAPACITIES: 100 lbs. to 100 tons per hr.
MOTORS: ½ HP to 400 HP

Rietz Disintegrators produce uniform particle size at extremely high capacities.

Send your problem materials to Rietz for free testing on Rietz equipment. Processed samples and a full report will be returned to you.

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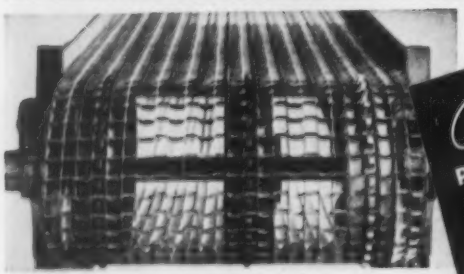

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FLEXIBLE STEEL CONVEYOR BELTING

Because this long wearing, sanitary conveyor belting resists heat, cold, moisture, oils, detergents, acids, grease, corrosion and is easily sterilized with steam or scalding water, it has gained the widespread acceptance of leading food manufacturers everywhere. It is ideally adaptable to grading, sorting, packing and peeling tables as well as scalders, washers, cookers, exhausters and other processing equipment. It will not stretch will not deteriorate while not in use and will not creep, weave nor jump. Its perfectly flat surface also provides for conveying all types of containers, empty or filled.
Available in 1" x 1", ½" x 1", and ½" x ½" mesh in any length and practically any width.

LA PORTE

Write TODAY for illustrated literature, prices.

MAT AND MFG. CO.
BOX 124 ***La Porte, Indiana***

of our sales, he noted. This past year, without decreasing in volume, it comprised only 46%. But packaged foods—such as cake mixes—have leaped from 9% (1938) to 28% today (GM introduced 25 new items this past year).

This continuing shift was hailed as a major contributor to GM's record sales ($516,000,000) and earnings ($14,057,000) for the 1955 fiscal year.

Builds High-Speed Bakery

An ultra-modern bakery, completely mechanized and containing sizable freezing facilities, will be a prominent feature of a giant new distribution warehouse now being built by Kroger Co. in Livonia, near Detroit.

Using automatic bulk-handling, weighing, and mixing steps, this latest bakery will have a simultaneous capacity of 13,000 lb. of bread, 3,000 lb. of cake and sweet goods, 3,000 doz. doughnuts, and 4,500 packages of buns per hour.

Medfly Search Widened

Continuous aerial spraying of Medfly-infested areas on Florida's East coast has now controlled the problem to a point where personnel can be shifted to detection work in other areas, according to USDA.

Search for the troublesome fruit and vegetable pest is now being extended to ports on the Gulf of Mexico, South Atlantic coast, and the Mexican border. And additional detection traps are being installed as far away as Puerto Rico, American Virgin Islands, and Jamaica.

Materials Handling Clinics

Help on materials handling problems is offered plant men by two, one-day clinics to be held in Chicago and Buffalo during November, announces the Material Handling Institute.

The Buffalo meeting, co-sponsored by U. of Buffalo, will take place Nov. 14. The Chicago clinic (Nov. 15) is co-sponsored by Illinois Institute of Technology and Northwestern U.

Fungicide Saves Picking $$

Substantial savings are being reaped by some Northwest berry processors who treat their picking boxes with a chemical fungicide,

sodium orthophenyl phenate, according to USDA.

Method consists of adding 1.2% of the fungicide to water in which bales of thin wood are soaked before they are formed into the square boxes, known as hallocks.

Tests show that over 90% of the treated hallocks are still usable at the end of the season. Less than 20% of the untreated boxes are worth saving.

Dairy-Course Roundup

Short courses and dairy meetings are slated at the following universities and colleges during the coming months:

U. of Illinois—Soft Frozen Dairy Products Conference, Oct. 25-26; Montana State College—21st Annual Ice Cream Short Course, Nov. 12-14; U. of Maryland—12th Annual Dairy Technology Conference, Nov. 13-14, 8th Annual Ice Cream Short Course, Jan. 21-30, 1957; Texas Technological College—8th Annual Dairy Industry Short Course, Nov. 14-16.

At North Carolina State College—Dairy Fieldmen and Sanitarians Conference, Nov. 19-20; U. of Kentucky—4th Annual Dairy Manufacturing Short Course, Nov. 27-29; Pennsylvania State U.—Supply Men's Ice Cream Course, Dec. 3-8, Short Course in Testing Dairy Products, Jan. 7-12, Plant Men's Ice Cream Course, Jan. 14-27, Market Milk Short Course, Jan. 29-Feb. 9, 1957. Rutgers U.—Ice Cream Short Course, Jan. 7-17, Ice Cream Mfr.'s Conference, Jan. 18; Cornell U.—Cheese Clinic, Nov. 15-16.

World Food Shorts

Frozen-Food Sales are on the increase in England, as evidenced by Birds Eye Food's new cold-storage warehouse at Great Yarmouth. Designed for fully palletized operation, the 3,700-ton facility employs temperatures in the —20F. range.

Proceedings of the recent International Bread Congress in Hamburg are available through Granum-Verlag, Detmold. Report comprises 83 papers covering grain storage and milling, baking, research methods, and nutrition.

Rum Butter, made for centuries in English farm kitchens, is fast becoming a commercial export item. Ingredients are butter, soft brown sugar, rum, and nutmeg.

Australian Bakers are using a special non-fat milk powder containing glycerol

the powerful answer to your liquid handling problems

INGERSOLL-RAND

MOTORPUMP

When production lags because of inadequate pumping facilities, you need the dependable power of an Ingersoll-Rand Motorpump. These pumps are designed for deliveries of from 5 to 2800 gallons per minute, they operate in any position and being compact, save floor space as well!

I-R Motorpumps are efficiently designed for economical performance and ruggedly constructed to stay on the job with a minimum of maintenance.

To get all the details on I-R Motorpumps in sizes from ¼ to 75 hp, write for complete catalog data.

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COLD DRAWN TUBING

In the sports field, the football quarterback is protected from the hard-charging enemy by his stalwart forward line. In the products field, the purity and flavor of food products is best protected by Wallingford Stainless Steel Cold Drawn Tubing in flow lines, coolers, pasteurizers, sterilizers, heat exchangers, evaporators, bottling machines and other food handling equipment.

Wallingford Stainless Steel Cold Drawn Tubing is furnished in analysis Types 304 — 304L — 316 — 316L with accepted sanitary polishing inside, outside, or both . . . or regular annealed and pickled.

Long-run economy is assured by low cleaning and maintenance costs, long life and uninterrupted service, and the elimination of product spoilage.

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"WALLINGFORD Quality Tubing and Pipe."

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WALLINGFORD, CONN., U.S.A.

COLD ROLLED STRIP
Super Metals • Stainless
Alloy • High Carbon • Low Carbon

WELDED TUBES and PIPE
Super Metals • Stainless

monostearate. New product, said to increase loaf volume, is marketed by K. L. Ballantyne Proprietary Ltd., S. Melbourne, Victoria.

Electrostatic Smoking of fish and bacon in new mechanical kiln cuts process time sharply. Developed at Torry Research Station, Aberdeen, Scotland, unit also enables close control and uniform smoke deposition.

New Plant to be built in Costa Rica will process and can banana puree for export, according to Atlantic Trading Co., Ltd., San Jose.—*McGraw-Hill World News.*

BRIEFLY

• FOOD SPENDING has increased 25% per household between 1948 and '55, reports USDA. Average weekly bill for the Nation, in spring of '55 was $27.

• **COMMUNITY RELATIONS ingenuity has solved a problem of broken windows at one food plant. Neighborhood kids were promised a picnic if they abstained from rock throwing during the summer school recess. Score to date: Not a single cracked pane.**

• CODE OF ETHICS has been adopted by the Package Designers Council that sets forth responsibilities of the professional designer to the industry, consumer, and his profession.

• **HIGH COST and scarcity of good chipping potatoes is causing potato chip manufacturers to lose up to 25% of price on every bag of chips made at the present time, declares the National Potato Chip Institute.**

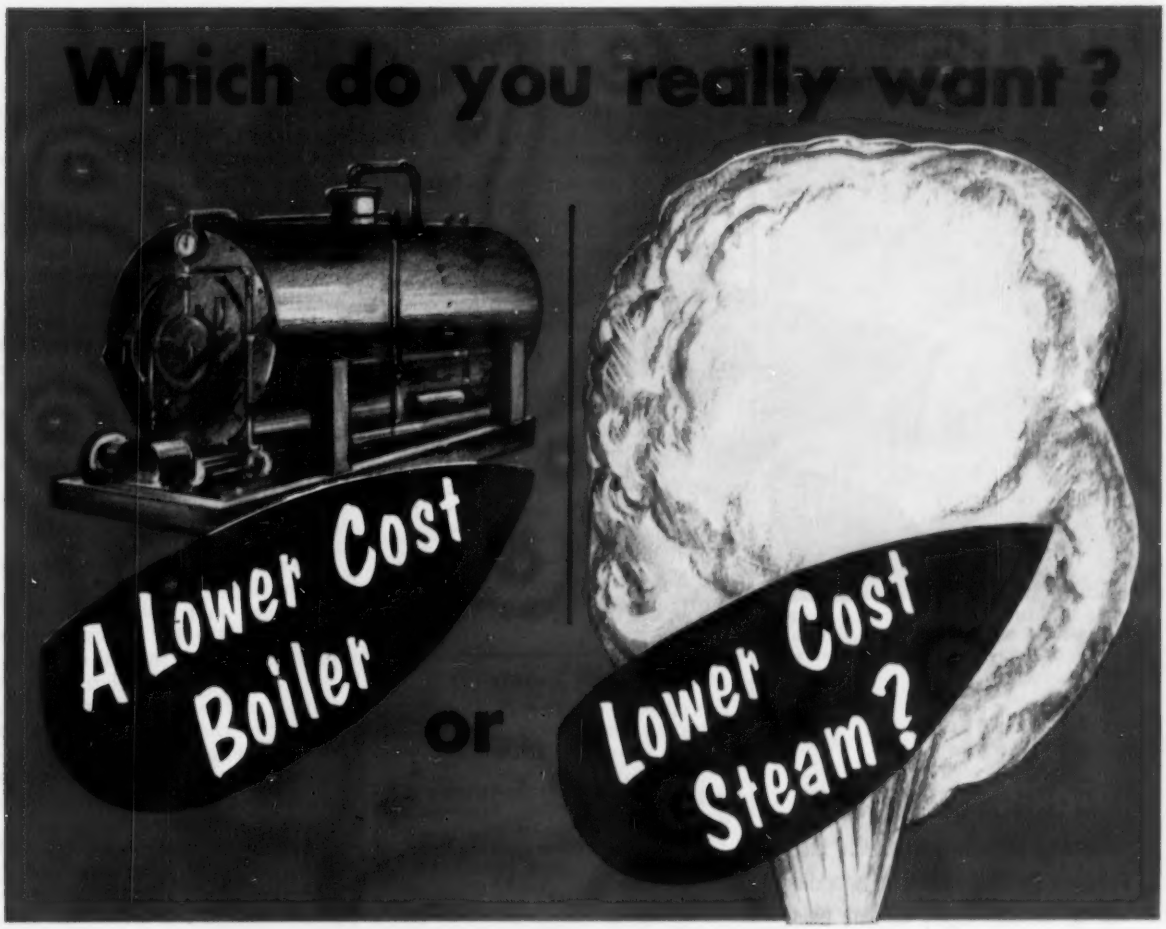
• SMOOTH KRAFT BAGS can now have the same antiskid properties as those made from rough kraft by treating the paper with a colloidal silica (DuPont). And the smooth paper stays cleaner and prints better than the rough, states the maker, St. Regis Paper Co.

• **CORPORATE CHARTER has been issued to the American Assn. of Cereal Chemists by the state of Minnesota, says Dr. Lawrence Zeleny, president of the AACC.**

• PRODUCTION YIELD of nonfat dry milk can be estimated from the butterfat content of the whole milk, according to USDA. Each change of 1% in butterfat content in whole milk is accompanied by a corresponding 0.4863-lb. change in solids recovered from 100 lb. of liquid skim milk.

Action on Standards

Following actions have been taken by the Agricultural Marketing Service (AMS) and Food & Drug Administration (FDA) on U.S. Standards and allowable tolerances



A word about price vs. cost

When you come right down to it, a boiler is only as "cheap" as the results it gives you! A low-cost boiler that's unreliable or incomplete is the most expensive one on the market.

That's why we've always built AMESTEAM GENERATORS up to a standard, not down to a price. Throughout our 108 years of building boilers, this policy has paid off in lower-cost steam for Ames customers. It is no coincidence that so many firms specify "AMESTEAM" on the strength of its reputation for reliability and economy of operation. Ames customers are invariably "repeat" customers! They know that lower-cost STEAM rather than a lower-cost boiler is the best buy.

AMESTEAM GENERATOR

20 sizes, 10 to 600 h.p. 15 to 200# Oil, Gas or Oil-Gas Combination.

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AMES IRON WORKS INC.
BOX B-106, OSWEGO, N. Y.

AMES IRON WORKS
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Please send me further information on AMESTEAM GENERATORS and name of the nearest representative.

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FILTRATION NEWS

CROSS-SECTION through new white MICRO-KLEAN element. Graded density provides filtration in depth, gives longer life, more complete solid removal.

NEW

5-micron filter

Provides 50% longer service life, polishes, purifies liquids to sparkling clarity, handles highly alkaline fluids

Cuno's new white MICRO-KLEAN filter cartridge (No. 2278-B2) brings a new degree of clarity and purity to beverages and other fluids demanding the utmost in filtration.

It's guaranteed to remove 98% to 100% of particles larger than 5 microns on the first pass of fluid plus a large percentage of particles down to 1 micron in size.

And, the new cartridge, retaining the true graded density features of Cuno's MICRO-KLEAN cartridge, lasts up to 50% longer than previous cartridges on recommended applications.

White MICRO-KLEAN is made of cellulose fibres, firmly bonded together with a totally inert resin. There's no possibility of contaminating fluid with harmful or bad tasting substances. What's more, the rigid structure formed by the bonding material prevents rupturing, channeling or distortion of the filter element.

Write today for the complete story on this latest advance in fluid purification. The Cuno Engineering Corporation, 24-10 South Vine Street, Meriden, Connecticut. 6.5

CUNO ENGINEERED FILTRATION

AUTO-KLEAN (edge-type) • MICRO-KLEAN (fibre cartridge)
FLO-KLEAN (wire-wound) • PORO-KLEAN (porous stainless steel)

of various pesticides on raw agricultural commodities. References are to Federal Register.

Limeade, frozen concentrate, AMS proposed amendments to U.S. Standards, *F. R.*, Aug. 17, p. 6198.

Pork carcasses, AMS establishment of amended U.S. Standards, *F. R.*, Aug. 18, p. 6215.

Onions, AMS establishment of amended U.S. Standards, *F. R.*, Aug. 21, p. 6251.

Currants, dried, AMS establishment of amended U.S. Standards, *F. R.*, August 31, p. 6555.

Tuna fish, canned, proposed Standard of Identity, *F. R.* Aug. 28, p. 6492.

Cacao products, alimentary pastes, bakery products, milk & cream, processed cheeses, cheese foods, cheese spreads and related foods, oleomargarine, margarine, Standards of Identity, *F. R.*, Aug. 31, p. 6566.

Figs, canned, Standards of Identity, *F. R.*, Sept. 8, p. 6824.

Schedule of Events

October

18-20—National Pretzel Institute, annual convention; Warwick Hotel, Philadelphia.

21-25—National Protective Packaging & Materials Handling Exposition; Kiel Auditorium, St. Louis.

22-26—National Safety Congress, annual convention; Conrad Hilton Hotel, Chicago.

24-26—Assn. of Food Industry Sanitarians, annual meeting; Hotel Casa Munras, Monterey, Calif.

28-N3—Dairy Industries Supply Assn., annual meeting (28) and exposition; Traymore Hotel and Convention Hall, Atlantic City.

29-31—International Assn. of Ice Cream Mfrs., annual meeting; Hotel Dennis, Atlantic City.

31-N2—Milk Industry Foundation, annual meeting; Haddon Hall, Atlantic City.

November

5-12—International Exhibit of Bottling Equipment & Related Industries; Parc des Expositions de la Forte de Versailles, Paris, France.

9—Nutrition Foundation and Institute of Food Technologists (So. Calif. Sec.), symposium on foods and nutrition; Huntington Sheraton Hotel, Pasadena, Calif.

10—Food Shop & Industrial Sanitation Seminar; Plankinton Hotel Sky Room, Milwaukee.

12-15—American Bottlers of Carbonated Beverages, international exposition & convention; Public Auditorium, Cleveland.

12-14—Grocery Mfrs. of America, annual meeting; Waldorf-Astoria Hotel, New York City.

26-30—American Society of Mechanical Engineers, national power & engineering exposition; Coliseum, New York City.

26-30—International Automation Exposition; Trade Show Bldg., New York City.

27-30—American Chemical Society, national exposition; Public Auditorium, Cleveland.

Instantizing Milk Solids

—*Continued from page 63*

took place in the collector, with the same results.

Engineers also found that uniform feeding of milk solids into the agglomerating section was critically important. But they attained such uniform feed through combined action of a delivery screw and Syntron vibrator on the feed hopper.

However, this created still another teaser—blow-back of air into feed hopper when screw and vibrator didn't operate uniformly. But again the engineers licked it—by installing a level control to automatically operate equipment supplying product to the feed hopper.

Processing Details

Here's a close look at how the new instantizing process works:

Non-fat milk solids (chocolate, malted, and other specialty milk powders, too) are shipped in 225-lb. polyethylene-lined fiberboard drums from 4 of the firm's drying plants. Solids are charged into a stainless steel, waist-high hopper (700-lb. capacity), with a 1-in. mesh top screen to hold back the liner and to facilitate powder distribution.

A series of conveyors—10-ft. and 12-ft. horizontal worm screws (6-in. dia.) and 30-ft. bucket elevator—deliver powder into a stainless, conical hopper (500-lb. capacity).

Automatic filling of the feed hopper is simplified by a high and low level indicating system. Feed conveyors automatically start up when level in hopper drops below 300-lb., and stop when it is full.

Loading hopper, as stated, is equipped with a Syntron vibrator to prevent product from "bridging" and to assure uniform feed. Rate of delivery into the stainless steel agglomerating tube (12-in. dia. by approximately 25 ft.) is adjusted through a variable speed-driven (¼-hp. motor) vertical-type auger (3 in. dia.) within the hopper.

Here, fine particles are wetted from a 2½-3% to 10-20% moisture content by a high velocity (4,000 to 5,000 fpm.) stream of humid air. Upon wetting, particles form into clusters about ¼ to ½ in. dia.

Filtered steam is nozzle-emitted at intake section of agglomerating tube. It is then mixed with high-velocity air brought in by a 15-hp. blower.

Steam line is provided with pressure-reducing valve, dryer, and traps to facilitate proper control and insure dryness.

Wetted clumps discharge into the

DEPENDABLE COLORS
for Discriminating Buyers

- Unlimited production facilities
- Complete technical service

- Accurate blending
- Nationwide distribution

Write us for Prices and Detailed Information.

U.S.P. Vitamins in bulk

Also available in carriers for easy, accurate and economical fortification of foods.

• • •

Roccal—the original quaternary ammonium sanitizing agent.

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SUBSIDIARY OF STERLING DRUG INC.

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WORLD'S LARGEST SUPPLIERS OF VANILLIN

See the ANSWER TO YOUR FOOD CONVEYING PROBLEM in this surface?

SANDVIK STEEL-BELT CONVEYORS

An eight-foot wide Sandvik steel-belt conveyor used for handling cans of shortening. The plant where this conveyor is installed has experienced up to 25 years of satisfactory service from an earlier Sandvik conveyor installation.

Sandvik steel-belt conveying work table makes cutting up of dressed hogs a continuous production line operation.

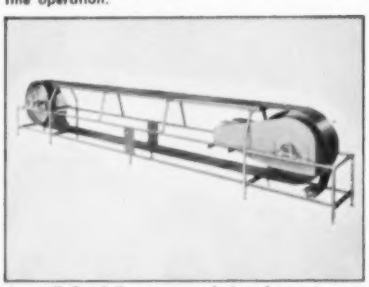
The smooth, impervious, easy-to-clean surface of Sandvik steel-belt conveyors has improved processing of a wide variety of foods. Here are some reasons why:

The conveying band provides a continuous, unbroken flat surface of stainless or carbon steel. — Live steam or boiling water can be applied directly. — Steel scrapers can be used for cleaning or discharge. — Withstands baking or drying temperatures. — No taste contamination. Smoothness facilitates slide handling (a vital advantage for can conveying). — High load capacity. — Long service life. — Belts can be of any length or width.

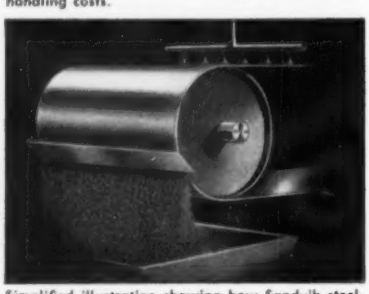
COOLING ARRANGEMENT—Sandvik conveyors can be built with a patented water-bed arrangement which cools from beneath . . . no water gets on top of the band. You can cool and convey, regulate thickness while cooling, cool and strip off gelatinous materials in sheet form, cool loose and pulverized materials, cool solids in sheet form and cool materials in layers.

ENGINEERING HELP—Sandvik's engineering department will be glad to work with you in designing a conveyor to fit your operation. Sandvik has had over thirty years of experience in designing conveyors to operate either as independent units or as integral parts of special processing equipment.

Write, wire or phone for further information.



A small Sandvik conveyor designed to cut meat handling costs.



Simplified illustration showing how Sandvik steel-belt was used in a continuous vacuum drier for soluble coffee. Scraper blade removes crystallized coffee from band.

SANDVIK
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BELT
CONVEYORS

SS-85

SANDVIK STEEL BELT CONVEYORS
Division of Sandvik Steel, Inc.
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conical, stainless steel collector. Air is tube-returned from top of collector to inlet of blower for re-circulation. It is continually re-heated and re-humidified by introduction of dry steam.

Agglomerating tubes (5 sections) and return tubes (6 sections) are secured by sanitary-type hand-screw clamps for easy removal and reassembly. Bottom of wet collector is mounted on rollers traveling on floor-level tracks to automatically compensate for expansion and contraction of this unit.

With the powder now wetted and "bunched up", it is ready for re-drying. From wet collector, it drops into barrel hopper of the re-dryer. Here, it is picked up by a high-velocity stream (4,000-5,000 fpm.) of 270 to 300F. air that is filtered through muslin cloths and heated by a bank of four steam coils.

Wetted clusters are re-dried to 2.8-3.6% moisture content in horizontal and vertical tubes and a second collector. Clusters are separated from re-dry air by collector, and delivered to shaker-cooler through a motor-driven (¼ hp.), stainless steel rotary valve. Moisture-laden air is discharged to atmosphere through re-drying section's second blower.

Shaker-cooler comprises a 2x15-ft., muslin-covered oscillating table, upon which re-dried clusters are cooled from about 180 to 110F. Cooling air is forced from below the table by a 1-hp. blower at 750 cfm. Collected in a hood above table, it exhausts to cyclone, where "fines" (approximately 0.25%) are recovered.

At discharge end of table, about 10% of the product passes through a 20-mesh screen (2¼x2½ ft) bypassing sizing rolls. Remainder passes over and into a stainless steel hopper feeding two pairs of adjustable, horizontal stainless sizing rolls (2-in. dia.), powered by a ½-hp motor.

From sizing rolls, product is gravity fed to a vibrating sifter. Or the sifter is bypassed. Product is then bulk-packaged into polyethylene-lined multiwall bags or drums.

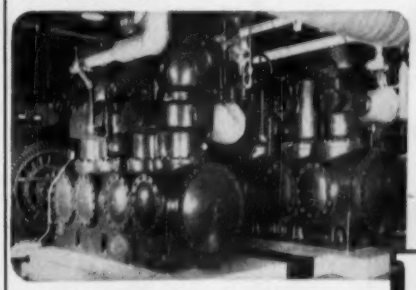
At Eau Claire, a line has just been set up to package the instant milk into cartons holding 9⅞ oz. (reconstitutes to 3 qt.) and 32 oz. (reconstitutes to 10 qt.).

Here, a 250-lb. drum is loaded into the hopper feeding a semi-automatic Elec-Tri-Pak filling machine (Triangle) with gross and dribble feeds. Machine handles 20 (32 oz.) and 28 (9⅞ oz.) paper pouring-spout type cartons (Marathon) per minute.

Bottom flaps of magazine-feed cartons are hand-guided over glue rolls. Cartons are then conveyed

FRICK Refrigeration Serves Big Esskay Plant in Baltimore

The Wm. Schluderberg-T. J. Kurdle Company operates the largest meat packing plant on the East Coast. Their Esskay brand products are recognized as top quality.



Frick 2-stage heavy-duty compressors at Esskay packing plant, Baltimore, Md.

The refrigerating system at the Baltimore plant has lately been expanded with additional Frick equipment. This includes three large compressors, operating in two stages; liquid ammonia pumps; and 18,400 feet of galvanized square-finned pipe. Results have been more than satisfactory.

When you want the ultimate in air conditioning, ice making, quick freezing, food processing or other refrigerating work, look to the nearest Frick Branch or Distributor. They offer complete A–Z engineering service, in principal cities throughout the world.

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BOWSER ESTABLISHED 1885

CUTS COSTS 3 WAYS

1 METERING

Bowser meters with ticket printers provide accounting records of liquid receipts, transfers and deliveries.

CONTROLS INVENTORY

Perpetual inventory and accurate control of process liquids in plant pinpoints profitable operation.

2 FILTERING

Bowser filters of all types are available for filtration of nearly every process or industrial liquid.

IMPROVES QUALITY

Uniformity of color and clarity with better quality control assures efficient processing of finer end-products.

3 BLENDING

Bowser blenders proportion and combine any number of liquid components in a continuous, closed system with highest accuracy at pumping flow rates.

SAVES MAN-HOURS

Hand "batching" is eliminated. Push-button control automates production to cut costs, improve profits.

Write for "DIGEST"

Bowser "liquid automation" equipment is available on lease or progressive payments to conserve working capital.

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Out Wears Them All!

Joint breakdown is virtually a thing of the past when brick and tile floors are grouted with Drehmann Joint Filler. This superior grouting material is a product of Drehmann floor research—developed by the pioneer and leader in the brick flooring field.

Drehmann Joint Filler provides flush tight joints. It is extra hard, extra dense, and highly resistant to impact, abrasion and the harsh action of acids, alkalies and other corrosives.

Drehmann Joint Filler is fast setting. A graduated measuring pail supplied with each batch assures accurate mixing. Drehmann Joint Filler is available in 100 and 200 pound drums. Orders shipped same day received.

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under filling machine spout, and top flaps are guided over glue rolls.

After being conveyed through a compression belt, sealed cartons are machine-overwrapped (Hayssen) with heat-sealable, laminated foil.

End (Resume reading on page 64)

Lab Has Latest Tools

—Continued from page 52

acteristics, through seed, barley plant, malt, and end-products.

Specifically, barley plants are "tagged" with radioactive CO_2 ("hot" C^{14} isotope) to study the effect of different kernel fractions through malting and brewing.

The barley plant is placed under a glass bell jar, where the $C^{14}O_2$ is released by reacting acid with hot barium carbonate. $C^{14}O_2$ is absorbed and fixed by the plant. Radioactive fractions (sugars, starches, fats, proteins, gums, etc.) are isolated. Certain amounts are then added to various stages of brewing to trace their possible role with, for example, colloidal instability or beer haze.

Tracing is done with a scaler, hooked up with a Geiger counter for determining amount of radioactive units in "hot" fractions.

This lab is also working on analytical procedures, especially isotope-dilution techniques.

Interesting studies are progressing on use of—

1. Warburg respirometer, to learn more about the role of enzymes during malting and brewing.
2. Chromotographic techniques, for proteins, amino acids, carbohydrates, etc.
3. Electrophoresis, as a method of evaluating purity in analytical separation of fractions in barley, malt, and beer.
4. Resinous-type ion-exchange, for separation of biochemical compounds in products.

What Controls Target

Controls: When a new crop year approaches, hundreds of samples of current barley offerings arrive at the lab. And Rahr wants to know how this crop—in all its forms—will fit into its picture.

What are its physical and chemical characteristics? . . . How will it compare, process-wise, with former crops? . . . What kinds of malt will it produce? . . . How will it affect the malt users' process and product in the season ahead? . . . And finally, what varieties and nativities should be purchased to do the best possible job for users?

These are the questions for the control section to answer.

Samples first flow into the barley lab for filing, according to growing area, and for evaluation of physical and biological factors. They are graded (screen- and ring-types), moisture tested, measured for surface brightness (check for molding or weathering) with reflectometer, and germinated.

When malts are prepared for analysis, they are thoroughly blended, divided, and weighed.

In a separate room, samples are ground. The room is maintained under slight vacuum to prevent dust contamination of nearby areas. Exhaust fan removes dust from room, which is also equipped with a variety of mills.

For convenience, ground samples are passed from mill room to scaling table by a 4x5x24-in. wooden tray that slides through wall partitions.

In various lab sections, stainless steel table tops facilitate handling of sampling cans. Tops wear well, and cans easily slide over them.

Unitized Setup

The analytical lab is arranged on a unitized basis so that various analyses of the malt extracts (determination of diastatic power and alpha amylase) are carried out in different sections. The well-planned setup enables lab workers to run through more samples with a minimum of wasted steps.

Ample sink spaces—sore spots and bottlenecks in most labs—are provided. There are also cabinets for storing glassware at the end of the day, thus the work tables are kept neat-looking.

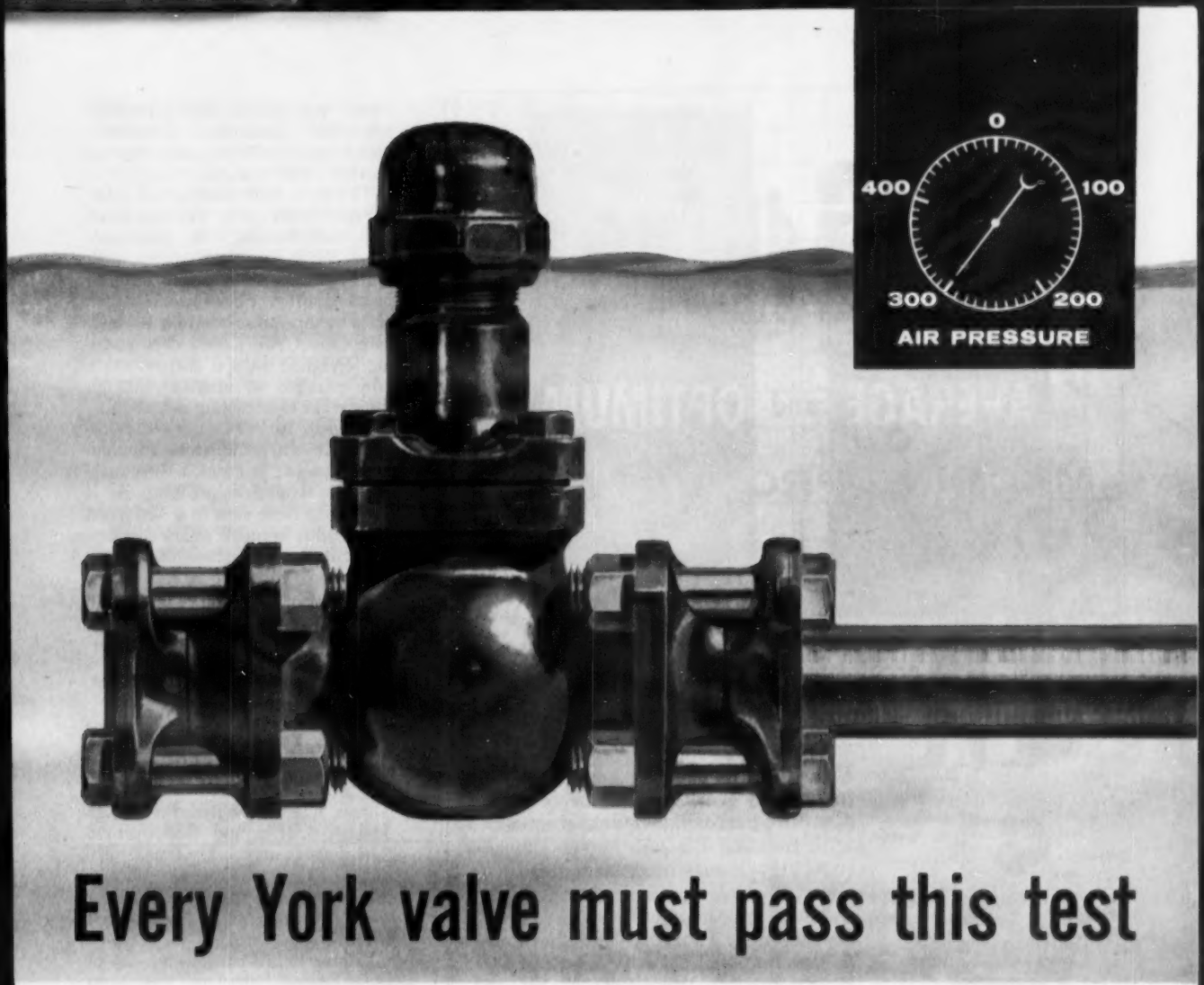
A portion of the lab is devoted to filtration and chemical analysis of worts. Characteristics such as extract, diastatic power, and alpha amylase are determined.

Protein analyses are run in a separate nitrogen lab. Room is separated from the main analytical section, and the fumes and heat are pulled out by an exhaust fan.

Another room contains an autoclave, incubators, microscopes, and colony counters. Checked, here, are microbiological characteristics of barley and malt.

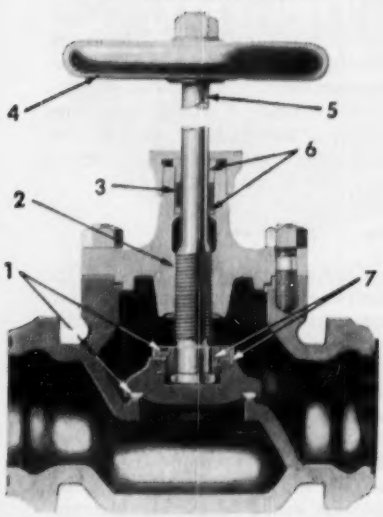
Experimental Maltings: Objectives here are primarily twofold: (1) to evaluate new barleys coming into plants as a guide to plant operations, and (2) to investigate new methods of malting.

Work is chiefly directed toward refining present malting methods. Here, barleys are steeped, germi-



Every York valve must pass this test

Thorough testing of York "Freon" and Ammonia valves guards against valve leakage, lessens risk of system shut-downs



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Valves are the control centers upon which your entire refrigeration system depends. Frequently valves represent 50% of the total cost of the piping layout. If a valve leaks it can entail shutting down the whole system for repairs.

York valves offer the best possible insurance against such costly shutdowns, because each valve is tested twice underwater, at air pressures of 300 pounds per square inch – first for leakage across the seat and then for over-all tightness. The smallest bubble in either test will cause rejection of the valve.

York valves owe their dependability and ruggedness to exceptionally tough metals and to superior design features, many of which are pointed out at the left. These features help account for the fact that there are more York "Freon" and Ammonia valves and fittings in use today than any other make. For more information about York's complete line – comprising more than 6000 types and sizes of valves and fittings – see your York Wholesaler of Accessories and Supplies or write: York Corporation, Subsidiary of Borg-Warner Corporation, York, Pennsylvania.

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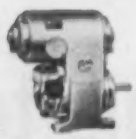

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nated, and kilned, under precisely controlled conditions. Electrically timed cams, switches, and recorders provide 24-hr. control.

The steep tank contains 16 stainless steel, rectangular, wire-suspended cans, each holding 1-lb. grain samples. Wires are hooked up with limit switches that are controlled by panel-mounted clocks to drop cans in a temperature-controlled water bath (about 50F.) for 2 days' steeping. Steeping water is also automatically changed at intervals through timing clocks actuating solenoids.

Steeped barleys are next transferred into the germinator's 16 manifold-mounted, perforated cans making three revolutions per hour. Air is jetted into these cans by a vari-speed positive-displacement pump that first passes it through a tank of refrigerated water. Excess air is bypassed to keep temperature constant in germinating chamber.

After 6 days' germination at about 55F., barley goes to kilns, where it is dried to about 4% moisture content, acceptable for brewing.

Another positive-displacement pump (with vari-speed drive) carries air through a series of electrical heaters. Temperature-controlled air current is first distributed by passage through 4 pipes and then over 48 cone-shaped units. Uniformly distributed air flows through the 16 cans with the malt samples. It is then exhausted to the outside, or returned to the kiln.

Kilning is carried out on a 24- or 48-hr. cycle. Provisions have been made to vary depth of malt bed over a large range to simulate more closely the plant operations.

Metal cams, cut to represent time-temperature, rotate by clockwork mechanisms of panel-mounted temperature recorder-controller to produce a variety of kiln-drying cycles (180F. at timer). Panel also contains an air-speed controller to deliver air over malt at varying rates.

The Little "Brewery"

Experimental Brewing: After analysis, it is important to know the performance of malt in the brewing process.

Fundamental interest here is to learn more about the relationships between barley, malt, and beer. Researchers are seeking findings that may be of use in improving barley varieties and malting processes. Final outcome would be the manufacture of a malt to produce an improved beer—better in appearance, stability, and taste.

There's also work on byproducts.

Sought is the upgrading (for a better return) of the small berried barley and malt sprouts that are cleaned out and sold for animal feed.

The experimental brewery carries four brews to completion simultaneously. And high capacity, in this case, is essential for scientific exactness and speed of operation.

Brewing table is equipped with four stainless steel cereal cookers (½ gal.) and mash tubs (1 gal.). Each pair has variable-speed agitators, electrical heating facilities, and hook-ups with temperature-recording instruments.

Below this table is the control system for the brewing process up to lautering. It cares for raising and lowering cookers and tubs, and variable transformers are employed here.

Temperature - controlled sparge water (75C.) is gravity fed through the mash bed in 30x4-in. lautering columns, and liquid (5,000 ml.) is collected in wort kettles. Wort is boiled for 2 hr. (with aid of temperature-controllers), with hops intermittently added. After the kettle "break" (coagulation of wort proteins), wort is separated from hops, cooled, and then "pitched" (yeast added).

Wort is now transferred to glass cylinders (3 in. dia. by 3 ft.) for 7 days' fermentation at 54F. Beer is then CO_2-transferred into 2-gal. glass jars for 3 weeks' aging at 36F. It is then filtered, carbonated, bottled, and pasteurized.

Completed brews are studied in the analytic section of the experimental brewery. Lab contains alcohol distillation equipment, micro-Kjeldahl units for protein determination of wort or beer, colorimeter for measuring oxidative- and chill-haze stability of beer, etc.

Taste Testing

Regular physical and chemical study of experimental brews had left an important void—measurement of flavor, aroma, and flavor stability. This gap is now bridged by an experienced taste panel. Its flavor work has proved accurate, reproducible, and most helpful in the development of more flavorful malts.

Finally, the results of all these research and control steps are interpreted in the light of data from former years. This information, plus knowledge of customer needs, results in advice to Rahr buyers on the grain-exchange floors, processing guidance in plants, and recommendations to malt users.

End (Resume reading on page 53)

Modernizing Conveyor Lines?

CHECK Weld-Bilt STEEL-BELT CONVEYORS

Custom-engineered to your exacting needs, Weld-Bilt "moving belts of interlocking steel — or stainless steel" offer profitable advantages. Positive tracking, they connot weave, buckle, stretch or creep. Friction-free, they run on ball bearing rollers, from positive slip-proof motor drive. And, best of all, they offer *unlimited life.*

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When a Cook-Chex is attached to a retort basket . . . *Anyone* in your plant can double check, at a glance, *two important* facts!

1. **The basket has, or has not, been through the cooking process.**
2. **It has, or has not, been subjected to *proper* cooking conditions.**

These two facts are important to you because they eliminate the usual problems of: a wrong cook schedule, keeping baskets in sequence, and the possibility of "losing" uncooked baskets!

Easy-to-use Cook-Chex signal these essential facts automatically! Cook-Chex, produced with a *purple* chemical ink, turn color to *green* only after your proper cooking conditions have been achieved. Cook-Chex react to precise conditions of temperature, steam and time; and, may be ordered to meet your specific cooking requirements.

Cook-Chex are also excellent as a low cost, permanent record for your cooking-room operations.

Double-check with Cook-Chex to insure uniform quality in your food products. Send for supply of Cook-Chex samples.

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Please send a FREE supply of Cook-Chex for use with a cooking process of _____ degrees F., for _____ minutes.

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New Yale Electric Trucks

Compact Yale sit-down truck maneuvers easily in narrow aisle ... speeds stacking operations.

The shortest 3,000-4,000 lb. capacity sit-down electric trucks—engineered to incorporate big-truck features—for fast narrow-aisle operations.

High Maneuverability

Short overall length (only 68¼" from front face of forks) allows the operator to maneuver quickly and easily for stacking from a 9' 10" aisle. Accurate inching control permits extra fast positioning of truck through a simple press-and-release operation of the brake pedal with the truck in first speed.

Truck and Operator Efficiency

The new K51W series includes Yale's exclusive, patented Magnetic Cam-O-Tactor for smooth, automatic acceleration. Hydraulic brakes and a 110 sq. inch braking surface give the driver reliable stopping power. "Dead Man" control automatically shuts off power and applies brakes when operator leaves the truck. Dual caster wheels make steering effortless.

Greater Visibility

The compactness of this truck plus the lowered cowl give the operator greater visibility for sure, fast travel and maneuverability without sacrifice of operator safety.

Adequate Power

A high-capacity battery (720 Amp/Hr) gives the Yale K51W extra power for fast lifting (up to 50 feet/min.) and high travel speeds (up to 6½ MPH). Side thrust rollers on both carriage and channels eliminate waste of power, reduce stress, keep lifting and lowering action smooth. Yale controller and motor connections cut use of current in lower speeds 20%...lengthens battery life.

For more detailed information send for Bulletin #5150 on the new 3,000 and 4,000 lb. Cap. Yale K51W series. Write The Yale & Towne Mfg. Company, Materials Handling Division, Philadelphia 15, Pa., Dept. 4610.

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PRODUCTS

Composite Frozen Confection by Successively Freezing Layers of Differently Flavored Substances—P. O. Lund, Chicago. No. 2,747,525. May 29, 1956.

Beer Stabilizer Comprising Compound of Ethylenediaminetetraacetic Acid and Alkali Metals Salts Thereof—E. Kneen to Kurth Malting Co., Milwaukee. No. 2,748,002. May 29, 1956.

Citrus Peel Product Consisting of Peel, Liquid Honey—W. F. Straub to W. F. Straub & Co., Chicago. No. 2,748,003. May 29, 1956.

Food Product by Adding to Fruit-Sugar Mass, Pectin and Edible Alkali-Metal Salts of Organic Oxy Acid, Dissolving Sugar, Adjusting pH, Refrigerating—H. T. Leo and C. C. Taylor, Anaheim, Calif. No. 2,749,243. June 5, 1956.

Non-Lumping Starch Containing Hydrophilic and Lipophilic Reagents—B. M. Winner, Whiting, Ind., to American Maize-Products Co. No. 2,749,244. June 5, 1956.

Stabilized Starch Slurry (42-45% Solids) Containing Raw Granules, Cooked Starch—J. W. Evans and G. E. Nelson, Highland, Ind., to American Maize-Products Co. No. 2,749,259. June 5, 1956.

Dehydrated Potato Granules by Slurrying Cooked, Mashed Spuds With Alcohol, Vacuum-Distilling, Adding Ethanol, Filtering, Agitating Cake, Drying—R. H. Treadway, Philadelphia, and E. G. Heisler, Plymouth Meeting, Pa., to USA. No. 2,750,295. June 12, 1956.

Frozen Meat Products by Fast-Freezing Raw Meat Blocks, Tempering, Slicing Into Thin Flakes, Tempering Flakes, Compressing, Freezing—H. M. Condon to Grand Duchess Steaks, Inc., Akron, Ohio. No. 2,752,252. June 26, 1956.

Want more information on any of these recent patents—if so, you may obtain detailed printed copies by writing direct to the U. S. Patent Office, Washington, D. C., giving serial numbers of those you want and enclosing 25¢ for each copy.

New Packaging Method Shapes Foods Into Cylinder for Slice Uniformity

Novel container for plastic-like foods (meats, puddings, dairy products) employs non-porous flexible casing sealed by rigid end-wall-forming disks. Package is filled through a segmented, self-closing aperture (arrow), which is then capped with a friction plug. Disks are secured by a flexible strand.—L. K. Snyder, Fleetwood, Pa. No. 2,751,306. June 19, 1956.

Low-Fiber Food Supplement From Dried Brewers' Grains, Having 45% Protein, 8-10% Fats, 82-93% Biological Value—J. A. Siefker, Webster Groves, and J. F. Brasch, Hanley Hills, Mo., to Anheuser-Busch, Inc., St. Louis. No. 2,754,211. July 10, 1956.

PROCESSES

Cracking Nuts Electrically by Subjecting to High-Voltage, High-Current Discharge, Preventing Flashing With Liquid Barrier—M. J. Kofoid, Seattle, to Northwest Nut Growers, Portland, Ore. No. 2,747,635. May 29, 1956.

Inhibiting Microorganism Growth on Citrus Fruit by Treating With Gaseous Tetrachloroethane or Pentachloro-

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A representative few of these foods, here shown, include those which are the best known and most widely bought by American consumers. Pneumatic's experience in the field is vast and varied—its intimate knowledge of the many peculiarities of food handling have led to the design of highly adaptable machines that operate at a "lower cost per container."

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ethane—H. J. Keller, Dunedin, Fla., to Minute Maid Corp., New York City. No. 2,748,004. May 29, 1956.

Canning Foods by Rapidly Heat-Sterilizing, Filling, Sealing, Sterilizing Can Interior and Seam, Cooling—W. E. Baier, Ontario, Calif., to Sunkist Growers, Inc., Los Angeles. No. 2,748,005. May 29, 1956.

Hydrolyzing Lactose to Glucose and Galactose by Treating Milk With Lactase Enzyme, Supplemental Activator—E. G. Stimpson, Sayville, N. Y., and O. E. Stamberg; Danville, Ill., to National Dairy Research Laboratories, Oakdale, N. Y. No. 2,749,242. June 5, 1956.

Determining Degree of Milling of Grain Flour by Treating Sample With Stain of Aqueous Solution of Aniline Acid Salt, Measuring Light Absorption, Correlating With Bran Content—E. Bauer, Berlin, Germany. No. 2,749,796. June 12, 1956.

Washing Eggs in Bulk by Supporting in Semi-Circular Form, Submerging in Wash Liquid, Rotating Horizontally—C. Burmeister, Saline, Mich. No. 2,750,293. June 12, 1956.

Removing Backbone of Fish by Cutting From Belly to Opposite Sides of Backbone—R. Baader to Nordischer Maschinenbau Rudolf Baader, Lubeck, Germany. No. 2,750,623. June 19, 1956.

Preserving Rough Rice by Storing in Atmosphere of 50-80% CO_2, 20-50% Air—S. A. Kaloyereas to Louisiana State University and Agricultural and Mechanical College, Baton Rouge. No. 2,751,305. June 19, 1956.

Disintegrating Solids by Mechanical Impact and Intense Sonic Energy—J. Lecher, Basel, Switzerland, to the Microcyclomat Co., Minneapolis. No. 2,752,097. June 26, 1956.

Conditioning Rice Paddy by Soaking in Water to Raise Moisture Content to 25-40%—R. C. Chandler, Palo Alto, Calif. No. 2,752,247. June 26, 1956.

Preparing Egg White Additives by Treating Liquid Whites With Sodium Hydroxide, Liquefying the Resulting Gel by Heating, Acidifying—P. Blick, Chicago, and E. W. Hopkins, Hinsdale, Ill. to Armour & Co., Chicago. No. 2,752,248. June 26, 1956.

Coating Fruits by Applying Oily Material That Produces Luster, Spraying With Hot Water—M. Kasser, Roseville, Calif. No. 2,752,250. June 26, 1956.

Determining Butterfat Content of Milk by Reducing Fat Particle Size, Measuring Light Transmission—R. L. Batchelor, Tenafly, N. J. No. 2,752,815. July 3, 1956.

Stabilizing Wine by Reducing Potassium-Salt Content by Ion Exchange—W. A. Wiseman to W. & A. Gilbey Ltd., London, England. No. 2,754,212. July 10, 1956.

PACKAGING

Carton Filler Having Magazines for Flat-Folded Tubular Cartons, Conveyor, Carton-Setup Mechanism, Can Inserter—A. F. Rose, San Jose, Calif. No. 2,747,348. May 29, 1956.

Labeler Employing Horizontal Endless Carrier, Heated Blocks That Press Labels Against Package—J. L. Golubski to Oliver Machinery Co., Grand Rapids, Mich. No. 2,747,757. May 29, 1956.

Container Casing Unit With Hinged Receiving Platform Upon Which Inverted Cases Are Placed on Containers, Means for Pivoting Platform to Invert and Transfer Case to Takeaway Conveyor—H. W. Solzner, Reeseville, to Brownsville Canning Co., Brownsville, Wis. No. 2,748,550. June 5.

Rotary Filler Comprising Stationary and Rotary Heads, Spouts, Ports, Valves, Synchronous Container-Moving Means—P. R. Sechheimer, E. F. Rowekamp, and A. J. Swain, to Karl Kiefer Machine Co., Cincinnati. No. 2,749,007. June 5, 1956.

Soft-Plastic Food Package Consisting of Base, Outwardly Extending Sidewalls, Product Cup Formed by Film Stretched Taut Between Top of Sidewalls—L. Peters, Evansville, Ill. No. 2,749,245. June 5, 1956.

Package Forming, Sealing Unit Having Rotary Sealing Rolls, Cross-Sealing Members, Interchangeable Rolls—H. P. Lewis, Newtown, Pa., to Pak Rapid, Inc., Philadelphia. No. 2,749,691. June 12, 1956.

Closure-Cap Marker Including Imprinter, Upper Mounting

Plate, Lower Support Member, Pivoted Arm, Drive—H. E. Stover, to Anchor Hocking Glass Corp., Lancaster, Ohio. No. 2,749,838. June 12, 1956.

Non-Drip Insert for Liquid-Dispensing Bottle, Comprising Circumferentially Spaced Webs on Exterior of Pouring Spout, Aperture Valves Having Central Opening—W. Opsitnik, Youngstown, Ohio. No. 2,750,063. June 12, 1956.

Paperboard Dispensing Container with Extensible Pouring Spout—C. R. Alden to Ex-Cell-O Corp., Detroit. No. 2,750,095. June 12, 1956.

Rewrap Container Consisting of Flat-Topped Carton, Side Sealing Lip, Inner Multi-Ply Closure, Gusset Folds, Tear Lines, Re-Sealing Panels—R. E. Jacke, Louisville, Ky., to Reynolds Metals Co., Richmond, Va. No. 2,750,101. June 12, 1956.

Vacuum Packager Employing Air-Evacuating Nozzle, Bag-Spreading Means, Clamping Jaws, Sealing Means—E. H. Lorenz, D. Waugh, and D. G. Merrill, W. Hartford, to Emhart Mfg. Co., Hartford, Conn. No. 2,749,686. June 12, 1956.

Liquid Filler, Closer for Paper Cartons, Employing Conveyor, Upright Tubular Supports, Liquid Reservoir, Transfer Assembly, Stapling and Sealing Mechanism—J. F. Earp and C. M. Clemens, to Ex-Cell-O Corp., Detroit. No. 2,750,721. June 19, 1956.

Carton Capper Comprising Cap Receiving, Inverting, Feeding, and Applying Means—J. L. Ferguson and R. C. Calboc to J. L. Ferguson Co., Joliet, Ill. No. 2,750,722. June 19, 1956.

Carton for Packaging Clusters of Cylindrical Objects—L. E. Arneson, Morris, Ill., to Morris Paper Mills, Chicago. No. 2,751,075. June 19, 1956.

Solids Packager Having Sampling and Checkweighing Means—F. R. Howard, Milton, to Pneumatic Scale Corp., Ltd., Quincy, Mass. No. 2,751,180. June 19, 1956.

Wrapping Unit Consisting of Package-Group Conveyor, Stationary Plate, Blank-Folding Means—H. G. Gentry, Atlanta, Ga., to Atlanta Paper Corp. No. 2,751,730. June 26, 1956.

Bag Feeder Having Rotary Bag-Body Feeding Drum, Magazine, Bag-Top Grippers, Rocker Arm—H. G. Kindseth, L. A. Steinberg, and A. A. Hagstrom, to Bemis Bro. Bag Co., Minneapolis, Minn. No. 2,753,097. July 3, 1956.

Defoaming Device Adapted to Withdraw Foam From Open End of Filled Milk Cartons, Separate Foam, Return Liquid Component to Storage Tank—J. E. Ward, Los Angeles, to Safeway Stores, Inc., Oakland, Calif. No. 2,753,098. July 3.

EQUIPMENT

Hydroponic Installation Employing Culture Bed Having Water-Impervious Bottom, Means for Circulating Nutrient Solution, Temperature Control—A. A. Steiner to De Nederlandse Centrale Organisatie Voor Toegepast Natuurwetenschappelijk Onderzoek, The Hague, Netherlands. No. 2,747,331. May 29, 1956.

Bread Depanner Including Pan Set Carrier Movable Along Upwardly and Forwardly Extending Runs, Tilting and Pan-Arresting Means, Laterally Spaced Upright Fingers—G. A. Jorgenson, York, Pa., to Read Standard Corp. No. 2,747,753. May 29, 1956.

Agitator for Removing Chaff From Roasted Coffee—H. Schmid and A. P. Hobush, Kingston, to Incoro, Inc., Kingston, N. Y. No. 2,747,496. May 29, 1956.

Combining Machine for Forming Coated Centers—D. Newland, Cedar Rapids, Iowa. No. 2,747,522. May 29, 1956.

Pretzel Twisting Machine Consisting of Horizontal Drum, Pivotal Twister Plate, Cam Track, Lever, Actuating Means—E. I. Groff, W. Reading to Quinlan Pretzel Co., Reading, Pa. Nos. 2,747,523-524. May 29, 1956.

Pan Greaser Employing Pivotally Mounted Nozzle, Actuating and Control Means—A. B. Peffer, Philadelphia. No. 2,747,539. May 29, 1956.

Produce Cooler Comprising Casing, Refrigeration Coils, Vacuum Pumps, Pan-Mounted Below Coils to Catch Condensed Water Vapor, Drain—T. J. Peukert, Sr., and F. J. Hibbs, Sr., Los Angeles. No. 2,748,576. June 5, 1956.

Sanitary Flavor-Injection Valve for Ice Cream, Consisting of Tubular Nozzle, Valve, Flow

Mojonnier

Multi-Stage EVAPORATORS

feature . . . • continuous evaporation
• low cost, low temperature operation

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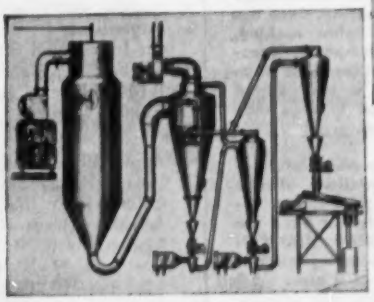

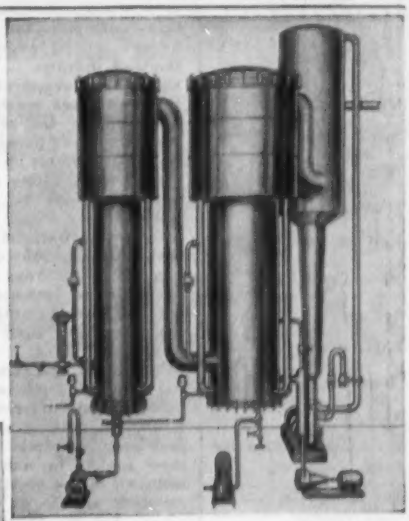

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for flavor control and operating economy

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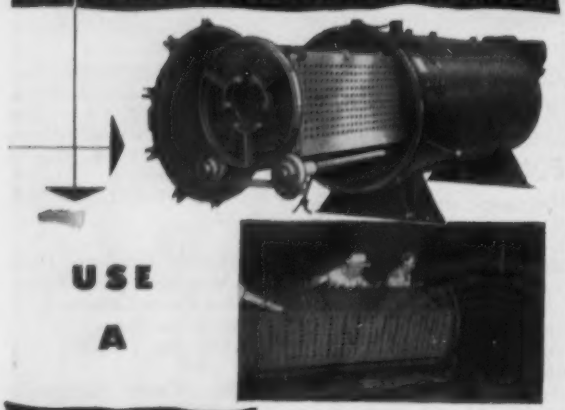

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To obtain better retention of flavor, color, and vitamins, the BERLIN CHAPMAN Sterilizer is widely used by the largest packers of food in the United States . . . originally designed for evaporated milk, hundreds of these machines that have been in use for over twenty-five years are still performing satisfactorily. Usually set up in a battery of 4 or 5 for one line of food at 120 cans per minute . . . made in three sizes to hold thirty, twenty, or fifteen cases of tall cans . . . equipped with one cage, one cage truck and one set of 96 trays . . . all shells are tested to 40 lbs. hydraulic pressure for working pressures up to 20 lbs. Also ASME code stamping.

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Control—E. C. Lehner and J. A. Brendle, to Swift & Co., Chicago. No. 2,748,724. June 5, 1956.

Sausage-Casing Stapler Consisting of Anvil, Staple Driver, Casing Holder—E. K. Buchy, Greenville, Ohio. No. 2,748,389. June 5, 1956.

Hog-Head Coater With Carcass Suspending Means, Open-Topped Liquid Container, Elevator Mechanism, Control—O. Hedstrom to Armour & Co., Chicago. No. 2,748,421. June 5, 1956.

Fruit Pitter Employing Upper, Lower Chains, Fruit Nests, Guides, Pitting Chain, Plungers—W. B. Peel, Oakland, Calif. No. 2,748,818. June 5, 1956.

Potato Peeling and Washing Machine—R. Mayer to H. H. Fox, New York City. No. 2,748,819. June 5, 1956.

Waste-Disposal System for Liquids Containing Suspended Solids, Having Settling Tank, Inflow and Outflow Means, V-Shaped Weir at One End of Tank, Rectangular Weir at Other, Recirculating Means—H. A. Trebler, Oakdale, and J. P. Horton, Sayville, to National Dairy Research Laboratories, Inc., Oakdale, N. Y. No. 2,749,302. June 5, 1956.

Mixer, Extruder Including Casing, Gear Pump, Conduit Means, Divider, Temperature-Regulating Means—C. Pasquetti, Varese, Italy. No. 2,749,571. June 12, 1956.

Potato Dicer Comprising Horizontal Conveyor With Upwardly Directed Pockets, Knife Assembly, Pusher—W. E. Buechele, Upper Derby, Pa., to Brock & Co. No. 2,749,955. June 12, 1956.

Proportioner for Feeding Powder Into Liquid Stream—P. A. Coffman, Jr., Warwick, R. I. to B-I-F Industries, Inc. No. 2,750,073. June 12, 1956.

Apple Celling, Slicing Machine Having Rotary Spindle, Seed-Celling Knife, Slicing Spider, Actuating Means—R. A. Ganze, Marion, to F. B. Pease Co., Rochester, N. Y. No. 2,750,976. June 19, 1956.

Onion Topper Consisting of Endless Chain, Topping Mechanism, Product-Aligning Air Blower—S. S. Vella, P. j., F. E., and C. F. Musso, to Air-Flow Onion Clipper Mfg. Co., Albion, N. Y. No. 2,750,977. June 19, 1956.

Dehydration Unit Comprising Liquid and Inert-Gas Supplies, Deoxygenating Chamber, Conduits, Holding Tank, Spray Dryer—D. P. Moore, Glen Oaks, N. Y. No. 2,750,998. June 19, 1956.

Combination Dough Handling, Proofing, Moulding, and Panning Machine—F. V. Marasso, Joliet, Ill., to Union Machinery Co. No. 2,750,899. June 19, 1956.

Peach Pitter Including Side-by-Side Conveyors, Coacting Clamps, Pivoted Inverted V-Shaped Cutter, Spring Means—O. Vanderhoofven, Delta, Colo. No. 2,750,975. June 19, 1956.

Can-Row Divider Employing Spaced Guides Having Single-File Inlet, Outlet Section Permitting Lateral Shifting, Retractable Abutment—H. G. Gentry, Atlanta, Ga., to Atlanta Paper Co. No. 2,752,027. June 26, 1956.

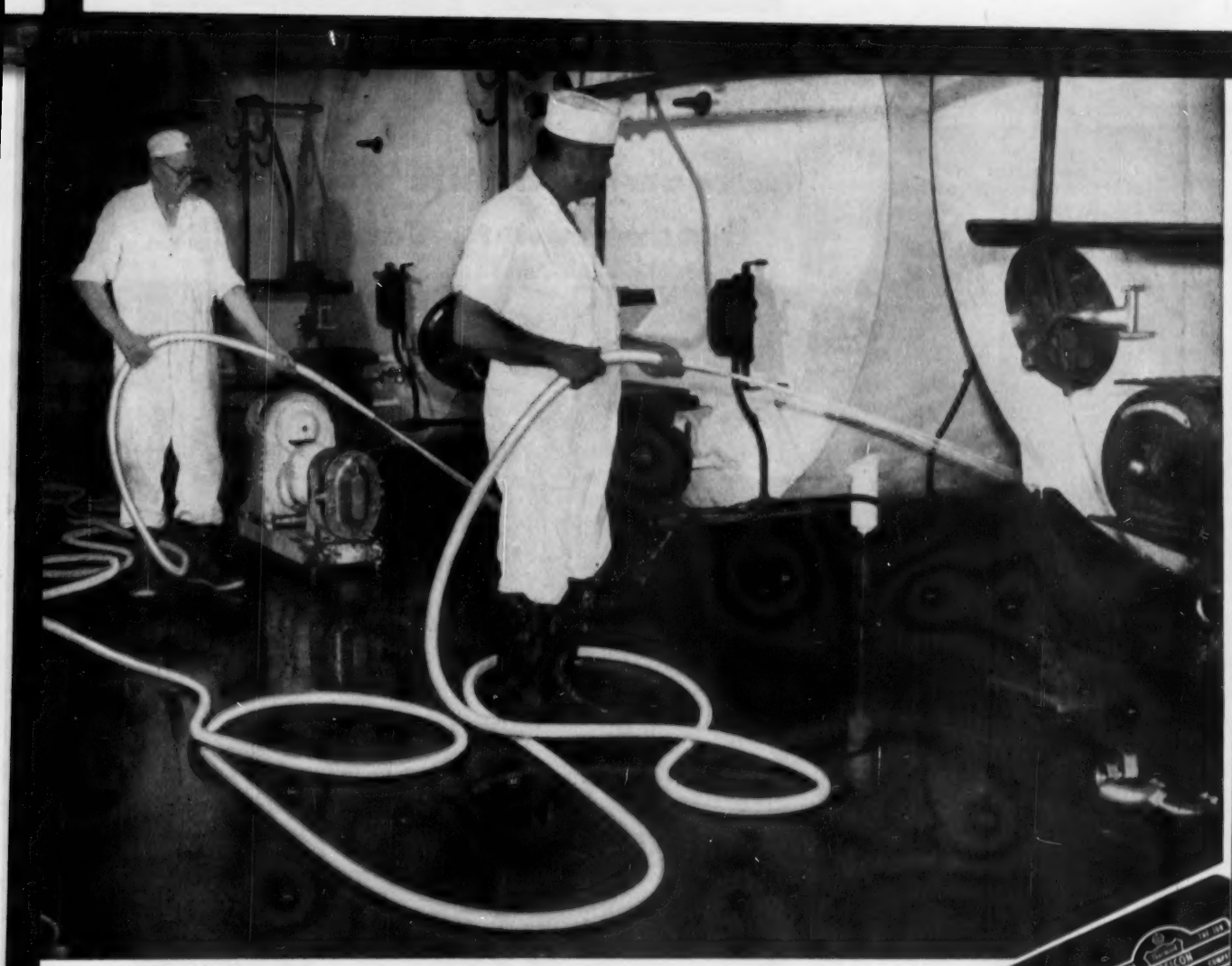
Shortening Handing System Consisting of Resetting Platform Scale Having Movable Platform, Pump, Conduit, Valve, Automatic Controls—F. O. Haile, Dallas, Tex. No. 2,752,118. June 26, 1956.

Beverage-Carbonating Unit Including Pressure Vessel, Liquid Feed, Distributing Means for Efficient Gas Absorption—W. J. Brendel, Ellicott City, Md., and J. F. Shapiro, Beverly Hills, Calif. to Sparkle Beverages, Inc., Ellicott City, Md. No. 2,752,137. June 26, 1956.

Meat Grinding Attachment for Extruding Product in Strip Form—H. B. Shadid, Oklahoma City, Okla. No. 2,752,629. July 3, 1956.

Molding Head for Dough Divider, Having Inlet, Discharge Openings, Wall Surfaces Forming Tubular Passage, Dough Receiving, Cutting Means—C. B. Seem, Zionsville, Pa. No. 2,752,866. July 3, 1956.

Unsafe-Temperature Indicator for Frozen Foods, Comprising Container, Sealed Capsule Containing Non-Toxic Polyhalogenated Hydrocarbon, Vapor Pressure of Which Bursts Capsule at Predetermined Temperature Below 30F—F. Di Renzo, Philadelphia, to J. J. McDevitt, Feasterville, Pa. No. 2,753,270. July 3, 1956.



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VERSICON most versatile hose ever developed. Handles air, water, oil, gasoline, dilute acids and gases.

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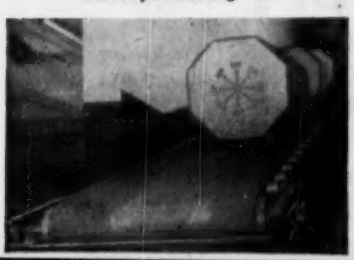

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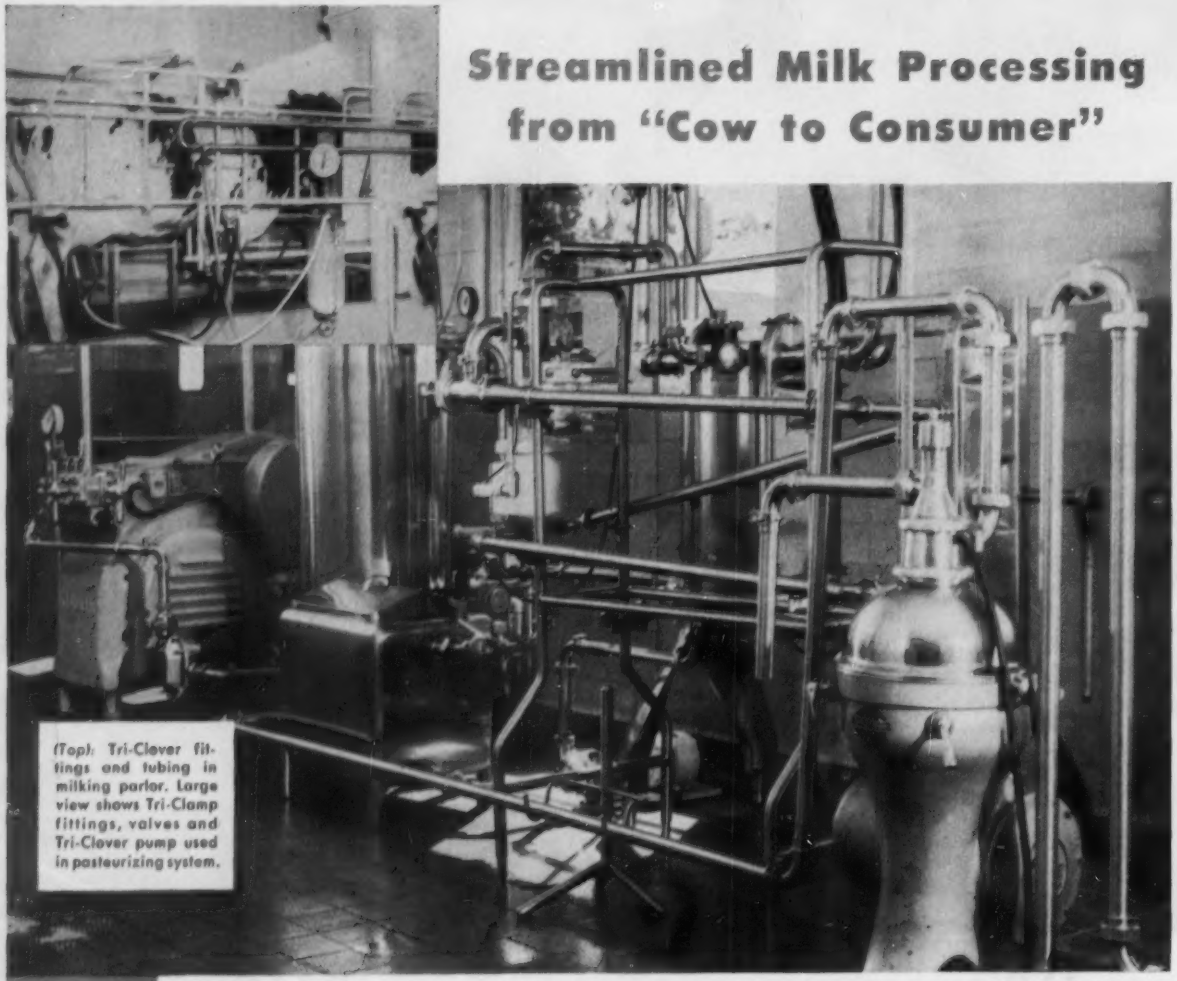
Streamlined Milk Processing from "Cow to Consumer"



(Top): Tri-Clover fittings and tubing in milking parlor. Large view shows Tri-Clamp fittings, valves and Tri-Clover pump used in pasteurizing system.

TRI-CLAMP
Snap-Action Spring Clamp, with toggle locking devices securely attached.
(Patented)

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Tee available in 1", 1½", 2", 2½", 3" and 4" sizes.

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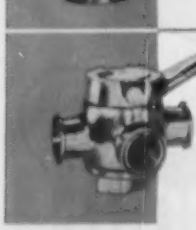
90 degree Sweep Ell available in all sizes.



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. . . SKY-GO Farms makes wide use of TRI-CLAMP® Fittings

After 10 years of planning, Sky-Go Farms of Fulton, Mo., has achieved the ultimate in streamlined milk processing . . . all the way from "cow to consumer" . . . and requiring only nine men for handling the production, processing, packaging and distribution of Premium Quality Grade "A" Milk through stores and vending machines.

Tri-Clover Division's snap-action Tri-Clamp Stainless Steel Fittings and Valves are widely used in the Sky-Go operation, helping to achieve high standards of efficiency by providing easily installed and easily maintained sanitary, corrosion-resistant milk lines . . . all the way from milking parlor to final filling operations.

Here, then, is another good example of the way in which modern dairies depend on Tri-Clover quality fittings, valves, pumps and tubing. Let us help you with your piping and pumping problems. *Write for descriptive literature.*

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MEN & COMPANIES

Industry

American Food Laboratories has moved into a new plant at 1000 Stanley Ave., Brooklyn.

Borden Co. will start construction on a new refrigerated biscuit plant and cheese warehouse at East Point, Ga.

Francis Food Plan Ltd., has purchased the Frosted Products Ltd. plant in St. Thomas, Ont.

General Baking Co. announces purchase of control of Van de Kamp Holland Dutch Bakers, Inc., Los Angeles.

Golden Grain Macaroni Co., San Leandro, Calif., has purchased Favro Macaroni Co., Seattle.

Hunt Foods, Inc., has completed a purchase of 100 acres of land in Davis, Calif. Site will be used for a new food processing plant.

Jordan Baking Co., Tacoma, Wash., announces a merger with Langendorf-United Bakeries.

Kent Dairy Ltd., Chatham, Ont. has been sold to Purity Dairies Ltd., Windsor, Ont.

Pepsi-Cola has started operations in its bottling plant at Las Palmas, Canary Islands, opened a regional office in Hong Kong, and purchased a two-acre site in the Parkdale area of Hamilton, Ont., for the erection of a new plant.

Poultry Producers of Central Calif. has initiated construction on its new 230,000 sq. ft. egg packing plant in San Leandro, Calif.

Proctor & Gamble announces acquisition of the cake mix division of Nebraska Consolidated Mills, Omaha.

Shedd-Bartush Foods, Inc., Detroit, announces it has purchased the margarine business and also pertinent equipment of C. A. Swanson & Sons, Omaha.

Southern Dairies Inc. has launched a $1 million expansion and modernization program at its plant in Norfolk, Va.

S. Kellogg plans to construct a new $5 million soybean and flaxseed processing plant near Breckenridge, Minn.

Texas Brands, Inc., has been formed to process and distribute nationally a major line of "Texas Style" frozen and canned cooked foods.

Welch Grape Juice Co. and the **National Grape Cooperative Assn.** have announced the purchase of the Welch firm by the association.

Laverne H. Fortin is the newly-elected pres. of Van de Kamp Holland Dutch Bakers, Inc., Los Angeles, new affiliate of General Baking Co.

Personnel

C. Wendell Beck has been appointed manager of the Dairy, Food & Machinery Department of Pfaudler Co.

Allen E. Crawford has been named manager of research and development, and **Donald S. Bartlett** manager of the Harrow, Ont., plant of W. Clark Ltd.

Fred K. Crosby has been appointed pres. of Ocoma Foods Co., Omaha.

Earl A. Clasen is the newly named manager of grocery products division of Pillsbury Mills, Inc.

W. A. Coon has been appointed to the newly created post of Pacific Coast regional gen. manager of Armour & Co.

J. C. Conrad has been elected v.-p. of General Bakeries Ltd., Toronto, Ont.

George H. Dickson, has been elected board director of Can-

what a year it's been for Holloway House!

Holloway House employees are just as critical of flavor as super market shoppers. That's why product samples must pass this weekly tasting session.

Supervisor Joseph Sukits brings restaurant know-how to modern food processing methods.

Ac'cent helps new processor to crack frozen foods market

The John R. Thompson Co. (Thompson Restaurants) launched their Holloway House brand of pre-cooked frozen foods through retail food stores in October, 1955. Because of their success with Ac'cent in restaurant operations, Thompson management from the beginning included Ac'cent to capture and hold peak flavor. Public acceptance has been so great that Holloway House is now expanding its Midwest markets and has obtained West Coast distribution.

Ac'cent intensifies and holds fresh, natural flavor without adding any flavor of its own. Like other processors of frozen and canned foods, Holloway House has found that Ac'cent gives their products a real competitive edge on flavor.

Ac'cent can do the same for *your* product! Best way to prove it is by calling an Ac'cent technical representative, or writing

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Remember flavor builds your business, and Ac'cent builds flavor!
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Keeps production--UP! Maintenance repairs--DOWN!

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Lasts two to four times as long as ordinary greases.

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1--Pure, unadulterated petroleum solidified oil
2--Practically odorless, tasteless, and transparent
3--Will not turn rancid--free of animal and vegetable fats
4--Cannot pit bearings--contains no alkalis
5--Non-corrosive--will not gum, cake, dry, or harden
6--Contains no fillers or abrasive of any kind
7--For use in all Alemite and Zerk fittings, and grease cups.

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Mr. B. D. Graham (left), v.-p. in charge of marketing, and **Mr. N. E. Daniels** (right), v.-p. in charge of purchasing, have been elected to the board of H. J. Heinz Co.

ada Packers Ltd. He succeeds H. M. Murray, who retired because of ill health.

Paul Corash has been named pres. of International Assn. of Milk & Food Sanitarians.

Gordon Edwards has been named v.-p. of Kraft Foods Co.

Dr. E. W. Eickelberg has been named plant manager of Chun King Sales' newly acquired Jackson, Ohio, plant.

Earl French, Red L Foods Corp., has been re-elected pres. of Eastern Frosted Foods Assn.

J. William Horsey has been elected pres. of Orange Crystals Inc., Plant City, Fla.

Maynard Johnson has been promoted to controller, **William E. Eakle** is new bottle shop superintendent, and **Richard Miller** is the new industrial and public relations representative of the National Brewing Co., Detroit.

George Karian is new head of F. J. Stokes Corp. Tabletting Division.

William S. MacDonald is new general manager of Mills Bakery, Boston, subsidiary of Continental Baking Co.

Spencer S. Meilstrup has been elected v.-p. of Diamond Crystal Salt Co., St. Clair, Mich.

Dr. G. C. North has been appointed to head Beatrice Food Co.'s newly created new products and materials department.

Ben Ormseth is new v.-p. of Green Giant of Canada Ltd.

William H. Pinchin is newly elected exec. v.-p. of Pillsbury of Canada Ltd.

H. M. Page has been elected to the board of H. J. Heinz Co., Canada Ltd., Leamington, Ont.

John G. Peterson has retired as board chairman of Cargill, Inc., Chicago.

Paul Ripp is new general plant manager of Armour and Co.'s Spokane, Wash., plant.

James A. Stewart has been named exec. v.-p. of Continental Can Co. of Canada Ltd.

Fred P. Slivon has been elected v.-p. and treas., **John B. Iglehart** is new secretary, and **Clinton B. Weston** is new general superintendent of California Fruits Division, Libby, McNeill & Libby.

Sidney R. Smith is new v.-p. of White Rock Corp.

Harold Thom is new manager of New England Fish Co.'s operations in Astoria, N. Y.

Charles H. Thomas is new staff v.-p., **William D. Pratt** is treasurer, and **Stanley J. Komada** is new comptroller of American Home Foods, subsidiary of American Home Products Corp.

Lyle C. Woods has been named manager of the chemical department of A. E. Staley Mfg. Co., Decatur, Ill.

Walter Wood is new director of product development and quality control for Ocoma Foods Co., Omaha.

Associated Industries

American Can Co. has broken ground for a new plant at Bayamon, Puerto Rico. It also announces plans for construction of its first plant devoted

exclusively to processing of tinplate at Hammond, Ind.

American Cyanamid Co. announces appointment of Dr. Walter L. Clark as director of food science teaching.

Automatic Transportation Co., Chicago, announces appointment of B. I. Ulinski as director of development and design.

Baker-Raulang Co., Cleveland, has named Ralph C. Reinhart director of manufacturing.

Bemis Bro. Bag Co., St. Louis, has appointed A. N. Weeks director of production.

Chase Bag Co., Chagrin Falls, Ohio, has named J. W. Means chief chemist.

Continental Can Co. has appointed Dr. Robert Mesrobian to the post of associate director of research in its new Research & Engineering Div.

Crissey Co., Kansas City, announces purchase of Bakers Engineering & Equipment Co., maker of KayCee revolving ovens.

Crown Cork & Seal Co., Inc. announces the election of Albert M. Norman as treas.

Crown Zellerbach Corp. plans to build a $4 million plant at Bogalusa, La.

Dobeckmun Co. has started operations in its new $2¼ million Brookside plant, Cleveland.

Evans Research & Development Corp. announces appointment of Dr. Everett G. McDonough as exec. v.-p.

Food Machinery & Chemical Corp. announces acquisition of Hudson-Sharp Machine Co., Green Bay, Wis.

Hoerner Boxes, Inc., Keokuk, Iowa, announces the completion of its new corrugated box plant in Little Rock, Ark.

Hunter Manufacturing Co., Solon, Ohio, has appointed H. O. Kirkpatrick v.-p. in charge of refrigeration.

International Assn. of Milk & Food Sanitarians has named John H. Fritz "Sanitarian of the Year."

Lincoln Plastics Corp. announces formation of Norwalk Plastics Co., Norwalk, Conn.

Northwest Packing Co. has completed its new plant in Portland, Ore.

Packaging Institute has elected A. Douglas Murphy pres., Harold Mosedale, Jr., v.-p. and treas., L. H. Zahn v.-p. and chairman of technical operations committee, and Charles W. Kaufman v.-p.

Rheem Mfg. Co., New York City, has appointed Andrew W. Hughes comptroller.

Richardson Scale Co., Clifton, N. J., has named Arthur J. Burke and William Hamilton as v.-p.'s.

Rodney Hunt Machine Co., Orange, Mass., has elected Ernest Schleusener v.-p., treas., and director.

Sharples Corp., Calif., has changed its name to Sharples Western Division.

Standard Brands Inc. announces appointment of Charles Gildea as director of industrial relations division. He succeeds Robert W. Griggs, who retired.

Ungerer & Co., Inc., has expanded its Chicago office and warehouse facilities.

Deaths

Almon C. Baker, 73, retired pres. of Brecht Candy Co., Denver.

Alfred Ghirardelli, 72, retired pres. of D. Ghirardelli Co., San Francisco.

Louis Katz, 87, manager and treas. of Country Club Soda Co., Springfield, Mass.

C. G. Lang, 66, founder of C. C. Lang & Son, Inc., Baltimore.

A. D. Marvin, 56, director of insurance, Green Giant Co., Le Sueur, Minn.

George A. Skarbo, 50, plant superintendent, Chignik Fisheries Co., Chignik, Alaska.

Al Lloyd Spalding, 76, board chairman, Canada Vinegars Ltd., Toronto, Ont.

Another Engineering Achievement in Packaging Automation

Now . . . YOU CAN PACK YOUR PRODUCT *Automatically!*

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1. CASE OPENER 2. ACCUMULATOR 3. PACKER 4. SEALER

The QUADNUMATIC was designed to fill a long felt need for a single unit to open and form cases, automatically accumulate the case load, inject it into the case, glue and seal.

This all steel pneumatically driven machine is a modern custom engineered unit only 16 feet long.

QUADNUMATIC accumulates any desired pattern in any number of tiers and opens and loads top opening or end opening cases.

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- POWDERED MILK
- HOUSEHOLD FOIL
- HOUSEHOLD WAX PAPER
- PACKAGED PAPER
- CANS OF PAINT
- PACKAGED SUGAR
- SPARK PLUGS
- OIL FILTERS
- TOILET TISSUE
- FLASHLIGHT BATTERIES
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- FLASH BULBS
- LIGHT BULBS
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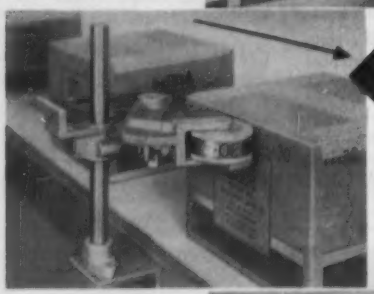
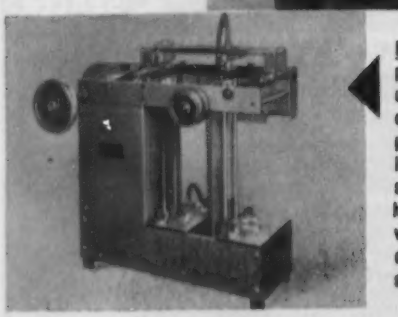
Top-Coder . . . imprints code-dates, other changeable legends on top surface of round or rectangular cans, canisters, jar covers, cartons, boxes. Attaches to conveyor or packaging machine. Locates imprints accurately even if container flow is irregular or intermittent.



Side-Coder . . . imprints side surfaces of folding cartons, set-up boxes, rectangular cans and canisters. Can be used to imprint codes, product identification, etc. simultaneously. Fully automatic, adapts to any mechanized production-line.

Bottom-Coder . . . portable, space-saving unit that imprints codes on bottom of jars, bottles, cans, etc. Imprint surface may be flat or concave, flush or recessed. Wheels right up to the line, can be moved about at will.



Label-Coder . . . foolproof, automatic bench unit that imprints codes on labels in bulk. Imprints up to 5 different legends on labels in a single run. Handles full hour's capacity of labels without attention . . . delivers them in perfect stack.

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PLANT ENGINEERING

Cold-Drawn Steel Tubing

Considers properties and applications of a line of cold-drawn stainless steel tubing, ranging in size from .008 to 1 in. O.D. 12p. —*J. Bishop & Co. Platinum Works, Malvern, Pa. (208A)*

Gear Motor Line

Full color presentation depicts series of internally geared motors that range from ¼ to 30 hp with gear ratios as high as 10 to 1. Single, double, and triple reduction units are covered. Sectional drawings illustrate details. Bulletin 1800, 16p.—*U. S. Electrical Motors, Inc., Los Angeles. (208B)*

Tray-Type Deaerator

Concerns tank-type units containing trough-shaped heating trays to speed deaeration of boiler feedwater. Cross section drawing shows action. Publication 4652, 4p. —*Cochrane Corp., Philadelphia. (208C)*

Hydraulic Control Valves

Gives facts on a wide line of hydraulic control valves, available with 3- and 4-way plungers, that fit eight pipe sizes from ¾ to 3 in. Pictures, diagrams, and charts supply details for fluid power systems up to 3,000 psi. Bulletin 80300, 16p.—*Oilgear Co., Milwaukee. (208D)*

Steel Pressure-Tubing

Brief facts on the mechanical and physical properties of seamless and welded, carbon-steel pressure tubing. Also, supplies information on various fabricating operations. Technical Data Card 142-A, 4p.—*Babcock & Wilcox Co., Beaver Falls, Pa. (208E)*

Lubrication System

Furnishes facts on a pressurized lubrication system for open gearing and slide surfaces. Diagrams and pictures show operation and installation. Bulletin 60-A, 8p.—*Farval Corp., Cleveland. (208F)*

Hydraulic Pumps

Pinpoints construction, selection data, and operations of a series of constant-displacement hydraulic pumps, available in 21 sizes, and rated for pressures from 1,100 to 3,000 psi. Bulletin 46000, 8p.—*Oilgear Co., Milwaukee. (208G)*

General Purpose Motors

Charts highly condensed information and prices for a wide range of different motor types in horsepowers from 1/20 to 200. 4p.—*Marathon Electric Co., Wausau, Wis. (208H)*

Waste Treating Equipment

Comprehensive booklet details and pictures a wide range of equipment for treating industrial waste. Included are bar and disk type screens, sludge collectors, chemical feeders, conveyors, and other essential components. Catalog 905, 64p.—*Jeffrey Mfg. Co., Columbus, Ohio. (208I)*

Motor Buying Guide

Pictures units and lists detailed information and prices for a complete line of standard, special, and gear-type motors. GEC-1026A, 12p.—*General Electric Co., Schenectady, N. Y. (208J)*

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For your convenience, too, all items in this department are listed and keyed in the Reader Service Section.

Packaged Heat Exchanger

Gives pertinent specifications and features for three, automatic, packaged coolers for process liquids. Explosion-proof, standard, and pilot plant models are depicted. Bulletin CH-3D, 4p.—*Mayer Refrigerating Engineers, Inc., Lincoln Park, N. J. (208K)*

Bronze Globe Valves

Details two pressure classes of bronze globe valves, available in eight sizes from ¼ to 2 in. dia., and rated at 150 lb and 200 lb S.P., 300 lb and 400 lb. WOG. Circular 602-2, 4p.—*Lunkenheimer Co., Cincinnati. (208L)*

Electro-Hydraulic Controllers

Pictures and describes a series of control units that combine high-speed electronics with positive-

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acting hydraulic systems for regulation of pressure, level, temperature, and flow. 4p.—*The Swiss Colony, Monroe, Wis. (208M)*

Thermostatic Valves

Concerns specifications for a series of thermostatic temperature-regulating valves, shower- and water-control mixing assemblies, and tempering valves. Special units are also depicted. Bulletin C-7, 8p.—*Lawler Automatic Controls, Inc., Mt. Vernon, N. Y. (211A)*

General Service Compressor

Contains selection charts and pertinent engineering information on a helical-screw air compressor that will handle air, gas or vapor. Unit can also be used for vacuum applications. Bulletin B-154A, 4p.—*Read Standard Corp., New York City. (211B)*

Dust Collecting Units

Considers features of cloth-filter and cyclone-separator types of dust collectors—and shows auxiliary exhausters, blowers and piping accessories. 10p.—*Porit Mfg. Co., St. Paul, Minn. (211C)*

Sanitary Pumps, Fittings

Specifies and prices an extensive line of stainless steel sanitary fittings for process lines. Also considers a variety of sanitary-type pumps.—*L. C. Thomsen & Sons, Inc., Kenosha, Wis. (211D)*

Turbine-Pump Performance

Detailed breakdown diagrams and construction specifications cover a series of single and two-phase turbine-type pumps for handling light, non-viscose liquids. Bulletin 111-VA, 4p.—*New York Air Brake Co., Aurora, Ill. (211E)*

Drain, Sampling Valve

Gives pertinent selection data on an all-steel valve for use in sampling and drain applications. Valve seats outside body for complete self-draining. Outside screw and yoke construction facilitates operation under severe conditions. Data Unit 294, 2p.—*Jerguson Gage & Valve Co., Somerville, Mass. (211F)*

Steel Tubing Facts

Details pertinent physical data for a line of stainless and carbon steel tubing, available in rectangular, round, or square forms. Presents information in either booklet or wall chart form.—*Republic Steel Corp., Cleveland. (211G)*

Weld-Type Fittings

Pictures and specifies a full line of seamless, weld-type pipe fittings and flanges made in carbon, alloy, and stainless steels. Bulletin FB-502, 6p.—*Babcock & Wilcox Co., Beaver Falls, Pa. (211H)*

Deaeration—How and Why

Discusses technical principles of deaerating boiler feed-water, briefs operations of various types of deaerators, and explains how and why they are necessary. Charts aid calculation. Publication 4650, 4p.—*Cochrane Corp., Philadelphia, (211I)*

Variable Speed Pulleys

Treats of operating characteristics and tables full selection data for a line of variable speed motor pulleys, designed for a range of ½ to ¾ hp. Bulletin 1630-B1, 8p.—*Worthington Corp., Harrison, N. J. (211J)*

Liquid Chillers

Gives benefits of a packaged liquid chiller for air conditioning systems. Cutaways show construction and operation of component parts. A separate section tables selection data. Capacities range from 2 to 150 hp. Bulletin DF-352, 24p.—*Trane Co., LaCrosse, Wis. (211K)*

Turbine Well Pumps

Two folders show full cutaway views and discuss comparative advantages for water- and oil-lubricated, turbine-type well pumps. Photos show typical installations. Bulletin WO-53, 12p.—*Layne & Bowler, Inc., Memphis, Tenn. (211L)*

Silent Compressor

Construction and advantages presented for a two-piston air compressor, said to give absolutely silent operation. Unit cycles between 25 and 45 psi. 4p.—*Squire-Cogswell Co., Chicago. (211M)*

Automatic Alarm Switch

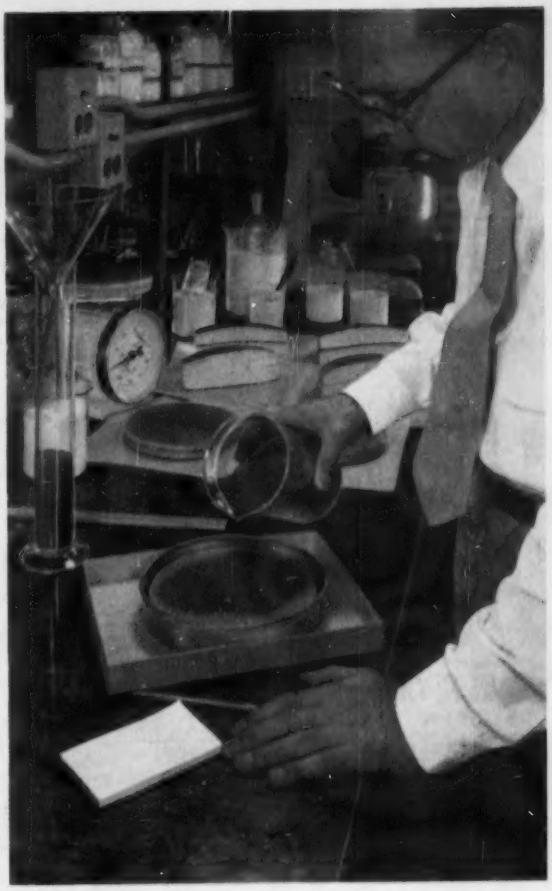
Considers features of a mercury-type relay switch that permits an operator to manually interrupt an audible alarm, yet automatically resets itself as soon as alarm condition has been corrected. Wiring diagram shows operation. Bulletin CA-8R, 2p.—*Mercoid Corp., Chicago. (211N)*

Underground Insulation

Tells how to apply a mineral-type insulating material to hot underground pipes. Discusses various advantages and applications. 4p.—*American Gilsonite Co., Salt Lake City. (211O)*

Compact Air Pump

Discusses construction and applications of a small rotary-type air pump designed for jobs that



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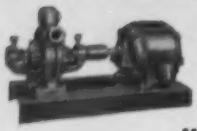

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require vacuums to 25 in., or pressures to 20 psi. Vanes are self-lubricating graphite, bearings are life-time sealed. 4p.—*Dexter Folder Co., Pearl River, N. Y. (211P)*

Plaster Fire Ratings

Considers building applications for plaster, acoustical plaster, and concrete containing vermiculite. Fire ratings for various walls, floors and roof deck are listed. 8p.—*Vermiculite Institute, Chicago. (212A)*

Condensate Return Pumps

Shows performance rating for single and duplex condensate-return pumps, rated at 6 and 20 gal. Construction features and dimensions are included. Bulletin 4958-B, 2p.—*Deming Co., Salem, Ohio. (212B)*

Malleable Iron Union

Colorful booklet pictures construction features of a malleable iron pipe union with bronze seats. Table gives working dimensions. 4p.—*Fairbanks Co., New York City. (212C)*

Steam Traps

Concerns operation of a series of 250- to 600-lb, impulse-type steam traps. Chart lists capacities, cutaway shows construction details. Accessory strainer is also shown. Bulletin 2-1739X, 6p.—*Yarnell-Waring Co., Philadelphia. (212D)*

MAINTENANCE

Paint and Varnish Removal

Folder pictures methods for removing paint and varnish from wood or steel surfaces with five different compounds. 2p.—*Ex-Cell-All, Chicago. (212E)*

Daily Work Guides

Gives wall-hanging pad to help maintenance men plan daily clean-up schedules for factories or buildings. Ninety sheets included.—*Advance Floor Machine Co., Minneapolis. (212F)*

Cleaning Hydraulic Oils

Technical publication covers detailed facts on storage and handling of hydraulic oils, and operation of hydraulic systems. Information aims at keeping hydraulic oils clean. 10p.—*Lubrication, No. 8—Texas Co., N. Y. C. (212G)*

Locating Pump Trouble

Cartoons diagnose common troubles—and their correction—for rotary, centrifugal and reciprocating steam pumps. Bulletin PC-508, 4p.—*Worthington Corp., Harrison, N. J. (212H)*

Protective Coating Chart

Chart compares applications and physical and resistance characteristics of various resin-based coatings when exposed to a representative list of foods and chemicals. 3p.—*J. Landau Co., New York City. (212I)*

Filing Cabinets

Gives all features of a series of multi-drawer filing cabinets. Many types are pictured and detailed. 12p.—*Remington Rand, New York City. (212J)*

Hose-Clamp Cutter

When it becomes necessary to cut off hose clamps, this drop-forged 14-in. cutter is essential, according to the bulletin. Tool has a single cutting edge and slip-land to prevent gouging hose. 1p.—*Punch-Lok Co., Chicago. (212K)*

Plastic Coating

Considers applications of a plastic compound that can be sprayed on even cold, vertical surfaces in thicknesses up to 60 mils. Bulletin SP-1, 4p.—*Metal & Thermit Corp., Rahway, N. J. (212L)*

Welding Equipment

Covers full line of gas-welding and cutting torches, gages, wrenches and other auxiliary equipment. Acetylene generator shown. Price list included. Catalog 150, 38p.—*Modern Engineering Co., Inc., St. Louis. (212M)*

Hose Clamps

Pictures a series of clamps, locking tools, fittings, and other accessories for fastening rubber hose to pipe. Clamps are sized for applications of ½ to 10 in. dia. 2p.—*Punch-Lok Co., Chicago. (212N)*

Brazing Filler Rod

Treats of an all-purpose nickel-brass brazing rod for joining and overlaying with oxyacetylene equipment. Characteristics and applications are detailed. Bulletin W-31, 2p.—*Ampco Metals, Inc., Milwaukee. (212O)*

How to Clean Floors

Step-by-step details of most efficient methods for sweeping and mopping floors and stairways. Numerous pictures illustrate techniques. 20p.—*Huntington Laboratories, Inc., Huntington, Ind. (212P)*

Protective Paints

Tells how to spray- and brush-paint various types of surfaces with a line of plastic paints. Tip sheet describes handling and cleaning of

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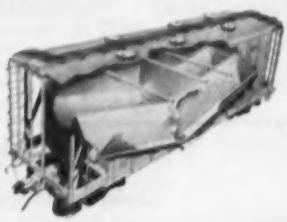

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Engineered to your production requirements and building facilities. Complete refrigeration systems included.

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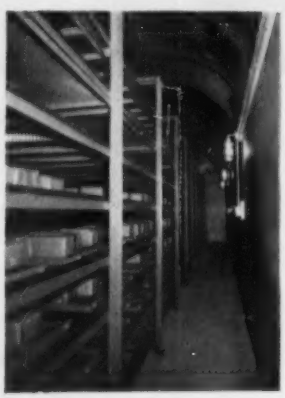

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spray equipment. Chart shows how to prepare surfaces. Bulletin 760, 30p.—*U. S. Stoneware Co., Akron, Ohio. (212Q)*

Overhead Conveyor Care

Tip sheet specifies periodic maintenance practices for overhead trolley conveyors that give smoother operation and longer life. —*Rapistan - Keystone, Inc., Grand Rapids, Mich. (215A)*

Gage Glass Cleaner

Illustrates features of a newly developed cleaning rod and swabs to remove stains from water gage glasses. Data unit 293, 2p.—*Jerguson Gage & Valve Co., Somerville, Mass. (215B)*

MATERIALS HANDLING

Package Conveyors

Pictures and relates operation of single, double, triple, and multiple conveyor belt installations, primarily designed for handling flexible packages. 4p.—*Doughboy Industries, Inc., New Richmond, Wis. (215C)*

Steel-Wire Conveyor

Illustrates various bakery applications of a special, steel-wire conveyor that features silent operation. Unit travels on Nylon belt guides and bearing strips. 8p.—*Union Steel Products Co., Albion, Mich. (215H)*

No Kick Wheel

Concerns installation of a steering wheel with clutching device built into the housing. Device eliminates "kick-back" when wheels hit holes or irregular objects. Application shown is tractor, but device is said to be adaptable to lift trucks. 2p.—*Kosch Manufacturing Co., Columbus, Neb. (215D)*

Small, Pallet Carrier

Reports features of two models of a stand-up-type pallet carrier, rated at 3,000 and 4,500 lb. Units are said to star in narrow-aisle operation. 4p.—*Knickerbocker Co., Jackson, Mich. (215I)*

Lift Truck Line

Presents full series of walking-type high-lift, low-lift, tractor, and special-model industrial trucks. Fork trucks have capacity of 1,000 and 2,000 lb. Units are electrically powered. Bulletin KHBM-12, 4p. —*Lift Trucks, Inc., Cincinnati. (215E)*

Speedy Elevators

Outlines operation of several fixed and portable elevating belts. Portable unit features hydraulic tilt adjustment. Available in 11-, 13-, and 15-ft lengths. 2p.—*Speedways Conveyors, Inc., Buffalo. (215J)*

Power Steering

Bulletin pictures and describes advanced, hydraulic-power steering system (1,000 psi.) available as optional equipment on all company trucks. Component parts are detailed. 2p.—*Towmotor Corp., Cleveland. (215F)*

Continuous Feeders

Relates condensed information on a line of continuous feeders, specifically designed for sticky materials. Various sized units are pictured, and charts list standard sizes and capacities. 4p.—*Pulver Corp., Perth Amboy, N. J. (215K)*

Cable Conveyors

Contains close-up details for three types of cable and trolley conveyors for handling light and heavy loads. Bulletin 40, 4p.—*E. W. Buschman Co., Cincinnati. (215G)*

Expanding Conveyor

Specifies an unusual conveyor that expands and contracts to meet the demands of loading operations. One unit has a range of 15 to 25 ft, second model stretches from 26 to 43 ft. 4p.—*Oliver Corp., York, Pa. (215L)*

PACKAGING

Bag Closers

Gives comprehensive specifications for a wide line of filled-bag sewing machines that close both paper and textile containers. Pictures illustrate each type of unit and many applications. Bulletin 200, 16p.—*Union Special Machine Co., Chicago. (215M)*

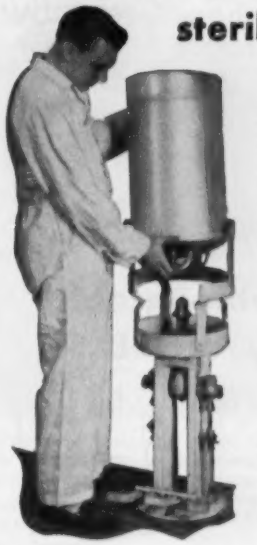
Testing Shipping Cartons

Bulletin describes and illustrates various tests for assuring ample product protection in corrugated packages. Includes a check chart for calculating efficiency of these shipping cases. Booklet 11, 22p.—*Hinde & Dauch, Sandusky, Ohio. (215N)*

Cup Packager

Details features and operation of automatic and semi-automatic machines for packaging cottage cheese, sour cream, and other similar products. Automatic ma-

This "pedal pusher" gets cans sterile and odorless in just seconds



Invert any mixing can up to 20" in diameter on a Cherry-Burrell Bestov Can Rinser-Sterilizer . . . step on the pedals . . . and seconds later your container is sterilized and odor-free.

Push Pedal 1 and a blast of cold water removes most clinging liquids or waste materials.

Push Pedal 2 and a heavy stream of hot water completes the cleaning operation.

Push Pedal 3 and jets of steam sterilize your cans . . . remove all odors.

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Here's the simplest and most efficient pump valve made for reciprocating pumps. The ROYAL CROWN PUMP VALVE has only three separate parts, yet its performance is revolutionary! Valve is guided by a frictionless ball stem which allows it to oscillate and turn with the fluid stream. Swings completely free with each stroke of the pump . . . seating each time in a new position. Resistance to fluid is reduced to a minimum which means greater pump volume at less pump speed. Adaptable to all reciprocating pumps . . . handles all types of liquids.

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(A) Round valve surface is streamlined. No obstructions to restrict the flow. (B) Ball-guided valve rotates and swings with each stroke of the pump. Each turn, each swing . . . a lapping action, a continuing perfect seat. (C) Free vertical action assures instant opening and closing. Ball stem is a frictionless guide.

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You don't have to buy expensive complete new wheels when tires are worn! Bolted assembly permits tire replacement in minutes—No special tools!

Next time you need new wheels, casters or trucks, change to Nutting Demountables. No stretch or creep under severest service—and only Nutting, pioneers in the field, has sizes and capacities for every type of truck or trailer.

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For details and a representative listing of the most complete floor truck line in America write for Junior Catalog **56-G** . . . or consult classified phone directory under "Trucks" or "Casters" for nearest Nutting representative.

SINCE 1891 **Nutting** TRUCK AND CASTER CO.

3132 DIVISION ST., FARIBAULT, MINN

Export Sales Rep.: SCHEEL INTERNATIONAL, INC., 4261 No. Lincoln Ave., Chicago 18, Ill.

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Spraco has the most complete line of nozzles available anywhere — **IN STOCK.** Capacities range from ⅛ pint/min. to 4000 gal./min. Bronze, cast iron, and stainless steel. Write for our nozzle catalog.

SPRAY ENGINEERING CO., *113 Central St., Somerville 45, Mass.*

chine operates at 70 to 80 cartons per minute, and affords automatic cup-dispensing, filling, capping, and coding. Small size table top unit also pictured. 4p.—*Triangle Package Mach'y. Co., Chicago. (215O)*

Tape Dispenser

Pictures three-model line of automatic tape dispensers that handle filament, glass fiber, cloth, heavy paper and plastic tapes. Bulletin 656B, 2p.—*Air Fixtures, Inc., North-Manchester, Ind. (216A)*

Silicate Sealing

Detailed explanation on principles of silicate adhesives and how they are applied on automatic sealing machines. Gives maintenance tips on how to care for adhesive-pans during shutdowns and other mechanical aspects of automatic box sealing. Bulletin T-7-2, 2p.—*Philadelphia Quartz Co., Philadelphia. (216B)*

Automatic Caser

Pictures illustrate step-by-step operation of an automatic casing machine for frozen-food packages or other regularly shaped cartons. Speeds range up to 240 packages per minute. Bulletin CMB601-W, 4p.—*Food Machinery & Chemical Corp., Hoopeston, Ill. (216C)*

PROCESSING

Flow Divider

Gives main characteristics and selection specifications for a rotary device that splits a single stream of any free-flowing dry material in up to eight accurate divisions. Bulletin 137, 2p.—*Sprout-Waldron & Co., Inc., Muncy, Pa. (216D)*

Dry Processors

Furnishes facts on a series of machines for mixing, crushing, grinding, separating and pulverizing dry, free-flowing materials. Selection charts list specifications. 8p.—*Sturtevant Mill Co., Boston. (216E)*

Batter Depositor

Briefs advantages of a piston-type filling device for depositing cake batter in cup-cake pans. Pan greasing attachment included in machine. 1p.—*Filler Machine Co., Inc., Philadelphia. (216F)*

Hop Strainer

Specifies construction and operation of a continuous separator for removing hops from brew. Sparging sprays provided if desired. 4p.—*F. C. Deckabach Sons Co., Cincinnati. (216G)*

Coffee Spray Dryer

Diagrams and gives condensed data for a spray dryer designed for soluble coffee. Three-stage collector is used to insure 100% product recovery. Bulletin SW-400, 4p.—*Swanson, Evaporator Co., Harvey, Ill. (216H)*

Meat Ball Maker

Affords brief description and pictures a machine for forming meat balls at the rate of 50 to 750 per minute. Quick parts permits running of many different-sized products. 1p.—*Allen W. Parker Co., San Francisco. (216I)*

INSTRUMENTS

Instrument Tubing

Concerns advantages of a line of instrument tubing, constructed of plastic and metal. Single and multiple-tube arrangements are available. Bulletin 456, 4p.—*Samuel Moore & Co., Mantua, Ohio. (216J)*

Recording Turbidimeter

For use in beverage control and water treatment, the described instrument continuously measures and records turbidity of liquid solutions. Schematic diagram illustrates operating principles. Bulletin GEC-1203A, 4p.—*General Electric Co., Schenectady. (216K)*

Complete Control Panels

Contains information and pictures that detail a wide variety of power and process control stations. Units feature complete recording and controlling elements for all variables. Bulletin G71-7, 16p.—*Bailey Meter Co., Cleveland. (216L)*

Dial Thermometers

Gives comprehensive specifications for a line of 3- and 5-in. bimetal dial thermometers with matching sockets. Units have large easy-to-read dials and ranges from —80 to 1,000 F. Bulletin 149, 8p.—*Manning, Maxwell & Moore, Stratford, Conn. (216M)*

Tank Gages

Concerns advantages for a series of hydraulic, hydrostatic, and direct-reading liquid level gages. Indicating and continuous recording models available. Remote control is featured. Bulletin 463, 4p.—*Liquidometer Corp., Long Island City, N. Y. (216N)*

Non-Indicating Controllers

Features selection specifications, such as scale ranges, for a series of non-indicating, electronic, potentiometer controllers constructed for surface or flush mounting applications. Bulletin F-7298-1, 2p.—*Barber-Colman Co., Rockford, Ill. (217A)*

Liquid Level Gage

Illustrates installation and appearance of hydraulic-actuated gage that provides remote indications of liquid tank contents. Comprises two components: A float type tank unit and a remote indicator. Bulletin 532, 4p.—*Liquidometer Corp., Long Island City, N. Y. (217B)*

Portable Thermometer

Shows features of a compact, portable, recording thermometer that can be bought or leased and is used for checking up on truck and rail shipments of perishables. Unit will run for 33 days without attention. 6p.—*Ryan Recording Thermometer Co., Seattle, Wash. (217C)*

Pneumatic Transmitter

Informs on a device for measuring either temperature, gage pressure, or absolute pressure. Unit relays data via a 3- to 15-psi pneumatic signal to indicating, recording, or controlling instruments. Specification Sheet S1003-1, 4p.—*Minneapolis-Honeywell Regulator Co., Philadelphia. (217D)*

Miniature Thermostat

Gives physical, electrical, and performance data for a series of tiny thermostatic switch controls. Catalog MC-124A, 4p.—*Fenwal, Inc., Ashland, Mass. (217E)*

QUALITY CONTROL

Specialized Lab Units

Concerns features of a series of special laboratory machines. Included are angle, superspeed, and refrigerated centrifuges, homogenizers, automatic pipettes, and ultra-microtomes. 8p.—*Ivan Sorvall, Inc., Norwalk, Conn. (217F)*

Equipment Clamps

Considers a line of aluminum alloy clamps for laboratory equipment. Devices are said to have great strength and a high melting point. They are equipped with Neoprene or asbestos sleeves. Bulletin 1040, 8p.—*Labline Inc., Chicago. (217G)*

PREST-O-MATIC® ELECTRIC COLD STORAGE DOORS
SAVE TIME and REFRIGERATION

Prest-O-Matic Doors save refrigeration by reducing "open-door-time", up to 75%. Doors are kept closed when not in use. Heat stays out, cold stays in.

Fork lift truck traffic moves through Prest-O-Matic doors quickly and automatically. No need for driver to dismount to open door.

Eelctrically operated Prest-O-Matics are supplied as complete units, easily installed. They seal tight when closed and slide out of the way when open. Available in single or double sliding models for coolers or freezers.

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FINE DOORS SINCE 1878
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FILLING MACHINE
Hope
TYPE 15MS

... You can buy several for less than the cost of one big machine

Another first for Hope . . . This new, small, streamlined floor model accurately handles liquid, viscous and semi-solid products quickly and at the lowest possible cost! Excellent for pilot runs, small operations, laboratory testing, small batches and short production runs of a color or product.

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FROM FACTORY STOCKS

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Is rust or corrosion in your lines a problem? Must your lines resist acids, remain sanitary? Now you can get immediate shipment from our factory of #303 and #316 Stainless Steel Snap-Tite Couplings. No waiting for special production runs on sizes through 2".

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SNAP-TITE COUPLINGS CAN HANDLE ALMOST ANYTHING THAT FLOWS

See Snap-tite's representative or write for Bulletin 240

Snap-tite, INC.
UNION CITY 6, PENNSYLVANIA

Large-Fish Processing

—*Continued from page 53*

chute and slide on their backs, tails first, toward the rotor groove. Here, the pins clamp them and a circular saw within the rotor immediately removes their tails.

Rotation of the machine next transfers them from the chute to the rotor groove, in which they are suspended with head-sections down. Pins and several guides hold them in the precise positions required for processing.

All subsequent operations take place as fish rotate 270 deg. and meet various cutting and cleaning mechanisms.

In traveling 90 deg. to their topmost position on the rotor, the fish are guided past knives that cut off bottom fins. Side and top fins are then removed by a saw and knife assembly. At the 90-deg. point, a second set of pins clamps the fish at the head sections to hold them against the rotor for the rest of the cycle.

As rotation continues, the fish pass under a circular saw that opens their bellies. A small knife then cuts their main arteries, and a wedge-shaped device flattens the open fish. Next, a metal scraper scoops out the viscera, and another scraper with rubber blades cleans the body cavities. Finally, rotating brushes remove interior thin skin and finish the cleaning.

When dressed fish reach the 270-deg. point, pins retract and fish drop onto the discharge conveyor.

The machine is 13 ft. long, 6 ft. wide, and 9 ft. high. It weighs 450 lb. and is V-belt driven by a 7½-hp. motor.

End (*Resume reading on page 54*)

Conveyors Lick Slow-Flow

—*Continued from page 61*

handling. One man in a car or truck can keep three men busy stacking incoming merchandise in the company's warehouse.

In almost every area, the system is so arranged that there is no reversing of merchandise flow.

Tower Controls Outgoing Items

In moving goods from storage to delivery trucks, clerks work from shipping orders. They place items on conveyors at any point in the warehouse.

The delivery system's control tower is located on a balcony between first and second floors. Here, by means of an intercom, the operator can give instructions to workers throughout the warehouse and, with convenient switches, he controls power conveyors on all floors. All shipments move through this control tower, where a final check is made before release to the shipping platform.

The control operator may make a rush call by intercom for "a case of tomatoes and two cases of grape juice for Smith's Grocery." Accordingly the cases are marked with buyer's name and number, then set on a conveyor. They next move to the tower, where they stop to be checked, then proceed to the loading dock for transfer to a waiting delivery truck.

In the words of Black Hills General Manager R. C. Swanson, "The equipment always keeps our merchandise flowing evenly, and so its highly preferable over our old hand truck system. It makes it easy to check goods in and out, and provides easy access to our entire stack."

End (*Resume reading on page 62*)

PUMP

Liquids • Gases • Slurries

WITHOUT CORROSION OR CONTAMINATION

Wavelike Motion of Steel Fingers Forces Material Through Tubing

Prices range from ..... $55 to $500 depending on size of pump and accessory equipment required.

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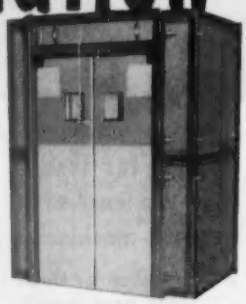

Traps Warm Humid Air before it enters your cold room . . .

A completely new idea. Eliminates former Vestibule shortcomings of ice on the floor, frozen doors, frost on product and malfunction of refrigeration equipment. Installed at the walk-in door, the aluminum wall and ceiling panels are always at cold room temperature. Infiltrating humid air is immediately trapped in the Vestibule, where the moisture is held on the panels. Defrosting is accomplished by brushing the walls or unlatching panels for removal to a warm room. Rigid angle iron framework, double swing self-closing doors.

Panels demount easily for defrosting

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MFRS. OF SHARP FREEZE, COOLING, VENTILATING AND HEATING SYSTEMS

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Now, the industrial engineer has his own convenient handbook filled with the kind of expert knowledge he can use daily on the job to lower costs and improve the quality of his product. This big book in eight big sections and 74 chapters enables you to understand and put to profitable use the best modern practice in work methods, work measurement, time studies, control procedures, etc.

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FACTUAL and how-to-do-it in approach, nearly five years in preparation, this book provides a storehouse of dependable information on every important aspect of industrial engineering: material handling, job evaluation, work measurement, wage payments, plant facilities and design, time and motion studies, automation, linear programming—to name but a few.

It's for the industrial engineer and the management man who wants fundamentals, methods, and data on the many diverse aspects of this field at his fingertips, in one convenient volume. Scores of experts, working under the editorship of one of the most distinguished leaders in the field, have each contributed a measure of their experience. The result is more than a dozen books in one, all pointing the way to improved methods, reduced costs, and greater profits.

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- **BUY** Ingredients, Equipment, Parts, Services

CARROT OIL makes food golden yellow

Carrot oil, like butter, contains carotene. Carrot oil is extracted from carrots, and each pound contains up to 25 million units of carotene, the international standard of vitamin A.

Carrot oil is preferred for vitaminizing foods because it is a natural vegetable oil and because it contributes vitamin A of high stability and desirable golden yellow color. Carrot oil is not synthetic, does not contain animal fats of any kind, and does not produce fishy flavor.

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New 36-page combined catalog on carrot oil for foods, feeds, and pharmaceuticals. Important reading for most food processors. Write today!

NUTRITIONAL RESEARCH ASSOCIATES
205 Broad St., South Whitley, Ind.

QUAKER CITY COLD STORAGE CO., INC.
PHILADELPHIA, PA.
3 WAREHOUSE LOCATIONS
Proper Temperature for Frozen Foods

the advertisements on the following pages

are live opportunities in the field of food processing and distribution.

Each announcement represents a current Want or Offering of an organization or individual in the field, with some element of profit in each for whoever can fill the need. Some have money-saving possibilities, others are opportunities for more business; many are employment opportunities; still others offer property, or equipment—used or surplus new equipment.

"Searchlight" advertisements are constantly changing. New opportunities are constantly finding their way into this great Want medium, each issue. Regular reading of the "Searchlight" pages can be as important to you as reading the editorial sections; Editorial matter is NEWS OF OPPORTUNITIES offered in the industry.

for EVERY business WANT
"Think SEARCHLIGHT first"

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The Advertisements in this section include all employment opportunities—executive, management, technical, selling, office, skilled, manual, etc.

Positions Vacant
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The advertising rate is $18.00 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

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Subject to Agency Commission.

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Positions Wanted—The rate is one-half of the above, payable in advance.

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Send NEW ADS or Inquiries to Classified Advertising Division of FOOD ENGINEERING, P. O. Box 12, N. Y. 36, N. Y. November Issue closes Oct. 26th.

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Excellent opportunity in Branch Sales Office of large industrial chemical company. We seek an alert and aggressive man to sell chemical specialties and detergents to food industries, milk and soft drink beverage concerns and provide technical service to general food plants. Previous experience in this field helpful. Submit complete resume to:

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New, improved containers for all types food packers either manufacturers or retailers. Fully accepted by trade nationally. Live leads furnished. Commission basis. Give age, experience, lines now carried, territory covered and references, all in strict confidence.

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321 So. Main **Fort Worth, Texas**

FOOD TECHNOLOGIST—CHEMIST
for production supervision, control and lab. work in spice-seasonings and related items. Knowledge of meats and meat products required. Excellent opportunity for good man with leading and growing firm. Salary commensurate with ability. All replies confidential.
FIRST SPICE MIXING CO., INC.
19 VESTRY STREET, NEW YORK 13, N. Y.

EQUIPMENT DEVELOPMENT ENGINEER
Position on Equipment Development Staff in General Offices of this well known, long established company. An Engineer experienced in the development and design of semi-automatic and automatic production equipment will find this an unusually stable company in the Philadelphia area with an excellent growth outlook. Salary is $7,000 to $8,500 area based upon background.
P-3009, Food Engineering
Class. Adv. Div., P.O. Box 12, New York 36, N. Y.

ASSISTANT FOOD PRODUCTION SUPERINTENDENT

Must be thoroughly familiar all phases of production, cost control, development, and general administration. Apply Personnel Dept. Schraft's, 36 W. 23 St., N. Y.

WE NEED

FOOD TECHNOLOGISTS and FOOD CANNING CANDIDATES
—junior to top-level

Call, write or wire:
Gladys Hunting (Consultant)
Drake Personnel, Inc.
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HArrison 7-8580

REPLIES (Box No.): Address to office nearest you c/o This publication Classified Adv. Div.
NEW YORK: P. O. Box 12 (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

Chemist and production foreman; practical man for modern food processing plant; familiar with syrup, flavors; write experience, age, salary, physical description. P-2973, Food Engineering.

Man with technical background in mechanical or chemical engineering to sell special equipment. Must be free to travel. Headquarters on Long Island, New York. P-2874 Food Engineering.

EMPLOYMENT SERVICE

Salaried Personnel, $5,000-$30,000. This confidential service established 1927 is geared to needs of high grade men who seek a change of connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. Jirathayer Jennings, Dept. F., P. O. Box 674, Manchester, Vermont.

POSITIONS WANTED

Chief Chemist Beet Sugar Factory experience in agriculture, process laboratory. Age 36. B.S. Chemistry. PW-2949 Food Engineering.

Purchasing Agent—impeccable reputation— top references—invaluable contacts—Age 37. PW-2954 Food Engineering.

Administrator—College Degree—23 years extensive experience in all phases of food technology and packaging. Technical administrative management in metal container manufacturing in addition to background of consulting, research and development, sales and service to food industry. Desire opportunity to capitalize on experience. Excellent references. PW-3104, Food Engineering.

Manufacturer's Representative, Chemist, well established,

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RA-1336, Food Engineering
520 N. Michigan Ave., Chicago 11, Ill.

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BOX NUMBERS . . .

to expedite the handling of your correspondence and avoid confusion, please do not address a single reply to more than one individual box number. Be sure to address separate replies for each advertisement.

To EMPLOYERS who advertise for MEN:

When there are many applicants for a single position it frequently happens that the only letters acknowledged are those of the most promising candidates. Others may not receive any indication that their letters have even been received by a prospective employer much less given consideration. These men often become discouraged, will not respond to future advertisements, and sometimes question their bona fide character.

Every advertisement printed in the Employment Opportunities Section is duly authorized.

It will help to keep our readers interested in this advertising if you will acknowledge every application received, even if you merely return the letters of unsuccessful applicants with, "Position filled, thank you" written or stamped on them. If you don't care to reveal your identity, mail them in plain envelopes.

We suggest this in a spirit of cooperation between employers and the men replying to Positions Vacant advertisements.

Classified Advertising Division
McGraw-Hill Publishing Co., Inc.

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EQUIPMENT WANTED or FOR SALE ADVERTISEMENTS acceptable only in Displayed Style.

Send NEW Ads or Inquiries to Classified Adv. Div. of Food Engineering, P. O. Box 12, N. Y. 36, N. Y., for November issue closing Oct. 26th.

20—Powder Hoppers, 304 Stainless Steel ⅛" thick. GEMCO Dust Tite 304 Stainless Steel Valve, on 5" Casters. Approximate Capacity 40 cu. ft. or 300 gallon. Unused.

1—#1A Devine Vacuum Shelf Dryer, 3 Heating Shelves 23½" x 29" Spaced 11" Apart. 18 sq. ft. Pan Surface. Unused.

1—U. S. Bottle Rinser, Serial #71046, 4 Sets of Stainless Steel Aprons, Rinse 50 Bottles one (1) Ounce to sixteen (16) Ounces, or ten (10) one Gallon Bottles. Unused.

1—Hudson-Bay Model SF-40, 40 Spindle Shell Freezing Unit with Dual, 2 Stage Refrigeration System. Used.

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Plant Salvage Department, John H. Compton

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Complete stock from 10-2,000 h.p.
Nation's largest inventory, New & Used

WABASH POWER EQUIPMENT
31 E. CONGRESS, CHICAGO 5, HA 7-4855

JACKETED MIXERS

WANTED: 4 to 6 late model, heavy duty, jacketed mixers with sigma blades, geared both ends, hydraulic tilt, 100 Gal. working capacity, 150 Gal. full capacity, preferably Baker Perkins or W & P. Write stating type, size, age, price and give general description and where they may be seen. Mfr. Ei Schnitzer, Loaf Brands, Inc., 1155 North Cicero Avenue, Chicago, Illinois.

OCTOBER SPECIALS

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LENGTH OF FILTER CYCLES

Filteraids are commonly rated as to effectiveness in terms of flow rate and clarity. For many filter press applications, however, cycle length is equally important. This is increasingly true as labor rates rise each year, so that the cost of press room labor becomes a larger and larger burden on the operation.

Cycle length is generally limited by declining flow rate towards the end of the cycle. In certain systems where high specific resistance cakes are formed, it may be necessary to terminate the cycle before the press is filled in order to maintain an average rate high enough to meet production demands. For most systems, however, cycle length can be extended to minimize labor costs. Three factors are of prime importance.

First, select the proper grade of filteraid. Filtration rates may be increased several-fold by employing the filteraid whose particle size range matches the filterable solids being removed. This insures freedom from migration of fines through the cake to blind the cloth and yields maximum filtrate volume per press cycle.

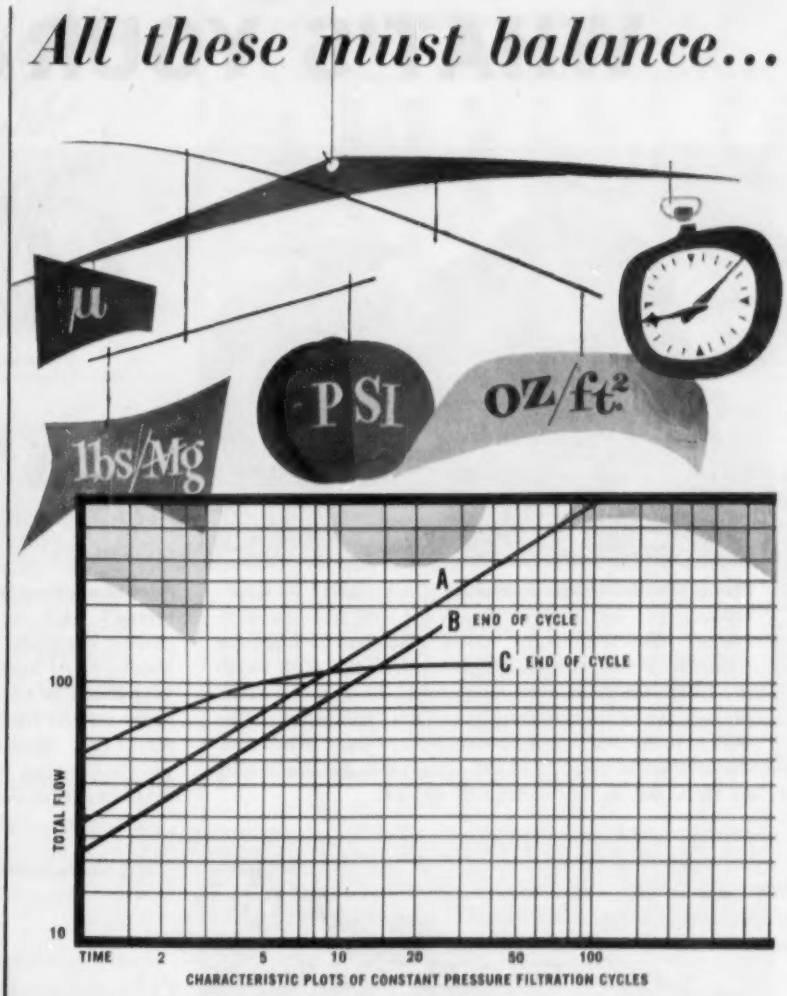
Second, select a filteraid of high quality. It is generally known that superior air classification is the heart of the filteraid manufacturing process. Few people realize that diatomite filteraid plants represent investments of millions of dollars, and include exceedingly complex air classifier circuits. In our modern plant at Lompoc, California, for example, the product passes successively through fourteen cyclone separators. These are all of highly specialized design, based upon twenty-five years of experience, and are not available to industry from the suppliers of standard dust collector equipment. High quality filteraids hold flow rate decrease to the theoretical 0.5 slope. Poor quality filteraids, though often possessing high initial flow rate (due to coarseness) tend to "tail off," as the cycle progresses.

The third important factor in extending press cycle length is to use the optimum percentage of filteraid. In many instances cycle length is limited through the use of excessive amounts of filteraid, thus filling the press prematurely and terminating the cycle. On the contrary, some customers use insufficient filteraid to maintain the desirable 0.5 slope.

In conclusion, filteraid technology is neither mysterious nor "arty." The selection of the best filteraid for most effective filtration can be established by carefully controlled tests. Claims for super performance should be viewed with suspicion, particularly unless claims are backed up by reliable data obtained either by technically sound laboratory tests (not slanted either deliberately or inadvertently through the selection of improper test conditions) or by actual plant scale test runs. Dicalite filtration engineers are fully competent to render this service. Their assistance is freely available. Don't fail to take advantage of this to improve your filtration efficiency.

P. W. Leppla, Technical Director

All these must balance...



CHARACTERISTIC PLOTS OF CONSTANT PRESSURE FILTRATION CYCLES

for MOST EFFICIENT FILTRATION

These plot lines, established in actual tests under plant conditions, clearly point up the importance of balancing *all* the filteraid factors — particle size; particle size range and distribution, precoat and body feed requirements. Line A shows the satisfactory flow rate and long cycle length obtained with such balance. Line B shows the result of too much filteraid — lower flowrate and short cycle, due to rapid filling of the cake space in the filter. Line C demonstrates the results of either insufficient filteraid or too coarse a filteraid; note the rapid drop in flow rate and the short cycle caused by solids blinding the filter screen.

For most efficient filtration, Dicalite provides a complete range of dependable, uniform filteraids to meet the requirements of practically any filtration. And Dicalite service engineers, working in your own plant, can help you "balance" your filtrations for highest clarity, optimum throughput and longer cycles.

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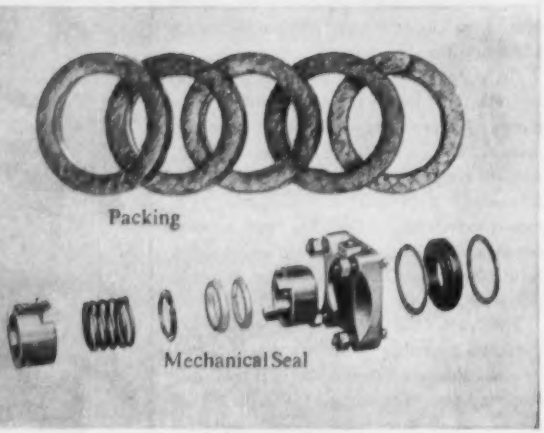
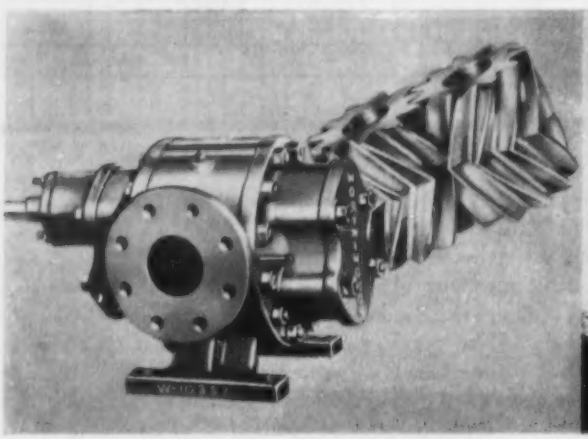
WHAT'S YOUR P.Q.?*

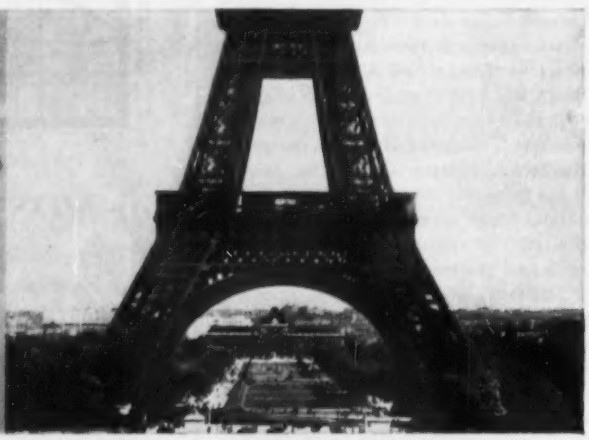
*PUMP QUOTIENT



Pump standardization—how do you benefit? By standardizing, you can often drastically cut your spare parts inventory. With Worthington's SESC (Standard End Suction Centrifugal) line, you are also assured of immediate delivery from factory or distributor stocks. Because the SESC line consists of standardized "parts" not "pumps," it can be built in many different combinations . . . 70,480 to be exact. For all these reasons, more and more companies are turning to SESC pumps. See bulletin W-300-B4.

Packed stuffing box or mechanical seal—which is preferred? Each has its applications. Mechanical seals are gaining in popularity year after year. With Worthington's Standard End Suction Centrifugal pumps you not only get your choice of mechanical seals—or packing—but you can easily convert from one to the other using standard stock parts. This "interchangeability" is just one of the many extra advantages of Worthington's SESC line. For more details write for bulletins W-300-B4 and W-350-B16.





Which pump is best for difficult suction conditions? Worthington's close-clearance rotary pump is self-priming and can operate under vacuums as high as 28 inches of mercury. The large unobstructed suction opening in this herringbone gear pump permits operation with thin or viscous liquids at high efficiency. The double-helical gears balance all end thrust, eliminate trapping of liquid between gear teeth and provide a quiet, pulsation-free flow at high speeds. For the full story, ask for bulletin W-483-B2.

Whose pumps would you expect to find in the Eiffel Tower? If you said "Worthington's," your P.Q. is all right. The original steam-driven pumps that power the Eiffel Tower's 100-passenger hydraulic elevators were built by Worthington back in 1889. The most recent additions, modern electric-drive Worthington pumps, moved into the Tower just last year. Today as then, wherever men must move liquid, they turn to the company with a reputation for performance. Worthington Corp., Harrison, N. J. PC. 6.5

WORTHINGTON

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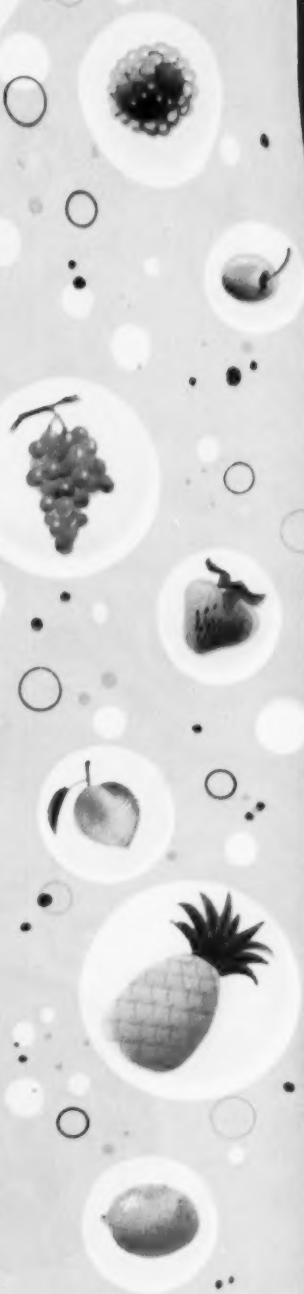
THE Sealva STORY OF "Sealed-In" Flavors



Some years ago, van Ameringen-Haebler, Inc. developed and introduced SEALVA Flavors, the first truly hermetically "sealed-in" high quality dry flavors. This new technique in flavor-making was immediately recognized and enthusiastically accepted by the food industry.

Since those early days, continuing improvements in sealing agents and drying techniques plus the basic superiority in the quality of the natural or imitation flavors themselves, have combined to maintain SEALVA's place as the ultimate in fully protected quality flavors.

What can SEALVA do for your product?

The adoption of SEALVA Flavors makes possible the use of absolute top quality flavor in dry mixes, because the finest of flavors are fully protected in their powdered form against the ravages of deterioration caused by evaporation, oxidation, extended shelf-life, and they are practically impervious to chemical reaction with other ingredients in a mix or compound.

Where can SEALVA Flavors be used to advantage?

SEALVA Flavors are ideal in any relatively dry, powdered, grained, or flaked mixture to insure inert flavor retention in such products as cake mixes, gelatin desserts, cereals, drink powders, pudding mixes, dairy mixes, ice cream mixes, candies (pressed wafer), pharmaceuticals, proprietaries, oil emulsions, etc.

For better flavor we ask you to investigate SEALVA Flavors before you make your final decision on this most important ingredient.

We are prepared to give you suggestions as to the methods of readily evaluating "sealed-in" flavors for your particular product and also will be happy to assist with technical recommendations for the application of SEALVA Flavors to improve your product. Literature and adequate samples are available.

Alva FLAVORS

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